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ILLUSTRATIVE OF

THE LATE RUSSIAN EXPEDITION AGAINST

KHÍVAH.

TRANSLATED FROM THE GERMAN OF LIEUTENANT CARL ZIMMERMANN, OF THE PRUSSIAN SERVICE,

BY

CAPTAIN MORIER, R.N.

WITH A MAP,

BY JOHN ARROWSMITH.

LONDON:

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ERRATA.

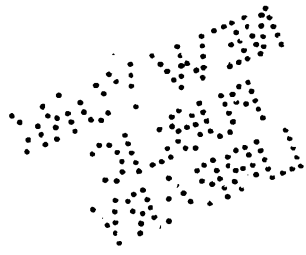
Page 7, line 17,	*for* hydrometric,	*read*	hodometric.
Line 26,	— hydrometrically,	—	hodometrically.
And in Note also.			
Page 9, line 1,	*for* 14°. 50′. 24″,	—	12°. 30′.
	For latitude 46°. 47′. 9″,	—	longitude 49°.
Line 4,	— 59°. 0′. 24″,	—	56°. 40′.
	— 114°. 10′,	—	117°. 0′.

This circumstance in itself is a sufficient earnest of the pains which have been taken to make it as complete as the materials to which the Author had access would permit. In the absence of precise information, we must be satisfied with the nearest approximation to the truth.

The reader will find in these sheets an abstract of almost every thing which has been published on the subject of Khívah, and its conterminous deserts, hills, lakes, rivers, and valleys, and no statements are made

without the authorities being quoted on which they are grounded.

The translation would have appeared earlier, if it had not been judged right to accompany it with a transcript of Lieutenant Zimmerman's Map, which has been laudably executed by Mr. J. Arrowsmith.



PREFACE.

THE following pages contain an attempt to give a sketch of the country between Orenburg and Khívah. The materials made use of, though scanty, have hitherto never been put together in a connected form.

I am much indebted to Baron Alexander von Humboldt for a considerable portion of these materials, which consist partly of written documents, but are chiefly derived from information obtained respecting the formation of the South Ural heights, which is of the more importance as it forms the mathematical basis upon which the map is founded, and includes the physical nature of the country.

For the letter of Dr. Lessing, at the end of the work, and other information, I have to thank my esteemed friend Carl Ritter.

The Contents are as follows:

1. The Mathematical Basis of the Construction of the Map.
2. The Maps referred to and the Geographical Information.
3. The Hydrographical Arrangement and Description of the Country in a military point of view.
4. Remarks relating to its Produce, and upon our imperfect knowledge of the wandering Tribes.

I. THE MATHEMATICAL BASIS OF THE MAP.

Mercator's Projection has been chosen, as affording the greatest facility in the construction of new maps.

The portion of the globe comprised in the map is situated between 39° and 53° of north latitude, and 49° 5′ and 62° 5′ of east longitude, upon a scale of 1:440000, or three English inches to a degree.

Places.	Latitude, N.	Longitude, E. of Greenwich.	Authorities.
	° ′ ″	° ′ ″	
South Point of the Island Oghúrchin.....	38 47 0	53 2 58	Kolotkin's Atlas of the Caspian Sea. 1828.
Mouths of the Ámú (Oxus)	39 15 0	.. .. ..	Bruce's Memoirs. 1782. p. 317.
Island of Chelekun	39 20 0	.. .. ..	Muraviev. 1824. p. 186.
Lake at the mouth of the Amu ?	39 30 0	.. .. ..	Bassargin's Map. 1832.
Mangishlák (the Lower Balkán).....	39 40 0	.. .. ..	,, ,,
Mosque on the Gulf of Balkan	39 42 0	.. .. ..	Bassargin, 1826. Eichwald, p. 175.
Cape Krasnovodski	39 48 25	52 56 58	Kolotkin's Atlas.
Krasnoyavoda Ruins.....	39 50 0	.. .. ..	Söimonov in Müller's Collection, p. 171.
Karà-Búgház Gulf.....	41 0 0	.. .. ..	,, ,, p. 170.
Cape Camel.....	41 0 0	.. .. ..	,, ,, p. 403.
Kenderlinsk	42 43 30	.. .. ..	Kolotkin's Atlas.
Rakushetsnoï (Cape Muscle)	42 46 15	51 58 58	,, ,,
Pechannoi-Ugol(CapeSand)	43 4 30	51 12 58	,, ,,
Alexander Bay.....	43 0 0	.. .. ..	Söimonov and Bekevitch in Müller's Collection, VII. p. 171.
Túk Karaghán	44 37 15	50 20 8	Trigonometrically ascertained. Kolotkin's Atlas.
Island of Kúláli, South End.....	44 39 0	.. .. ..	Söimonov.
	44 48 21	50 14 30	Kolotkin's Atlas.
——— North-West End	44 59 0	50 3 58	,, ,,
Svyátöi (Holy) Island....	44 49 0	50 23 58	
Gulf of Mangishlak.....	45 0 0	.. .. ..	Jenkinson, 1558.
	44 30 0	.. .. ..	Eichwald's Map of the Caspian Sea.
Gouriev.....	47 6 47	51 58 8	Kolotkin's Atlas.
	47 3 38	51 58 50	Göbel's Journey, p. 336. Petersburg Calendar. 1836.
	47 6 37	51 58 39	Wiesnievski, according to A. von Humboldt's Tables, not yet printed.
	47 7 0	51 44 24	Falk's Supplement, I. p. 172.
Mouth of the Ural.....	46 18 0	.. .. ..	Falk's Supplement, and Müller's Collection, VII. p. 403.
Uralskoi (Uralian)	46 20 0	.. .. ..	,, ,,
Sarachikovskoï (Sarachikovian)	47 30 30	51 53 24	Göbel's Map.
Kalmykova (Calmuck) ...	49 2 13	51 38 24	Göbel's Journey: the longitude is hydrometrically ascertained.
Uralsk (Uralian)	51 11 49	51 22 39	A. von Humboldt's Tables.
	51 11 23	51 22 46	Göbel's Journey, p. 336, according to Schubert's Petersburg Calendar.

☞ The first time each proper name occurs it is correctly accented; but it has not been thought necessary to repeat the accents throughout.—Trs.

LONGITUDES

	Remarks.
	The longitudes in Kolotkin's Atlas are reckoned from St. Petersburg, the true longitude of which is 27° 58′ 44″ East of Paris. This beautiful Atlas, a work of many years' labour, which had undergone several revisions, not only before it appeared, but also as referring to Eichwald's journey, was found to be very correct.—The depths of water alone required some alterations, in as much as they were found to have varied in many places.
	The island of Dargah was fully discovered by Bassargin and Eichwald.
	This is a Russian possession, according to the Atlas of the Russian Empire. 1823.
	47° 8′ on the map, according to astronomical observation.
	Probably a misprint, which has remained uncorrected.
	In the Petersburg Calendar, 43° 20′ 27″ ? probably 49° 20′ 27″.
	In the map under 49° 7′ 30″.

Places.	Latitude, N.	Longitude, E. of Greenwich.	Authorities.
	° ′ ″	° ′ ″	
Mouth of the great river Uzen, in the Kamush Samarah Lakes	48 47 0	49 50 24	Göbel's Journey, p. 336, according to hydrometric measurement.
Orenburg	51 45 59	55 6 39	A. von Humboldt's Tables.
	51 46 0	54 56 24	Falk's Supplement, I. p. 183.
	51 51 0	.. .. ..	Büsching, V. p. 463, in Rychov's Orenburg Topography.
Orsk (Orenburgian).....	51 12 0	58 12 24	Falk, I. p. 189.
		58 25 24	The Maps of Meyendorf and Levshin.
West Coast of the Lake Aral.....	45 38 30	58 29 23	Dr. Lemm, by Lunar observation; A. von Humboldt's Fragmens Asiatiques.
Astrakhán (Azhderkhán, or Azhderhá)	46 21 12	48 2 54	Falk.
	46 21 17	48 5 24	A. von Humboldt.
	46 20 53	.. .. ..	Göbel's Journey, p. 336; Schubert's Petersburg Calendar. 1836.
	46 20 18	48 4 58	Kolotkin's Atlas.
	45 0 0	.. .. ..	Jenkinson. 1558.
Sellizúr	43 0 0	54 20 24	Lapic's Map; Ritter's Geography. 1818. II.
	42 20 0	58 30 24	Kyrillov's Map in Astley's Collection.
	43 30 0	57 35 24	Arrowsmith.
Sellizur*	43 20 0	53 44 24	Beauchamp's Map of his Journey; in Von Zach's Monthly Correspondence. 1801. April number.
	42 45 0	55 25 24	Atlas of the Russian Empire. 1823.
Khívah	40 25 0	56 45 24	Atlas of the Russian Empire. 1823.
	40 30 0	60 0 24	Eichwald's Map. 1834.
	41 37 0	60 30 24	Levshin's Map. 1831.
	40 40 0	59 50 24	Wieland's Map. 1832.
	40 40 0	59 30 24	Berghaus' Map. 1829–34.
	41 30 0	59 20 24	Burnes' Map, by Arrowsmith. 1834.
	41 20 0	57 50 24	Reichard's Map. 1821.
	41 27 0	59 18 24	Burnes' Map. 1834.
	41 48 0	57 58 24	Kinnier's Map. 1809.
	41 16 0	58 3 24	Arrowsmith's Map. 1813.
	38 30 0	63 0 24	Thompson's Map. 1740.

* On the Caspian?

LONGITUDES.

Remarks.

Lieutenant Euler observed the transit of Venus in this place, in 1769.

One of the most important circumstances of late years which has furthered the advance of geography in this part of the world, was the military expedition, under the command of General von Berg; who, with a strong body of troops, undertook the survey of the Turkoman's Isthmus, in the winter of 1825. Dr. Lemm succeeded about the same period in ascertaining the true longitude of the West coast of the Lake Aral, by lunar observation, and found it to be 56° 8′ 59″ East of Paris (58° 29′ 23″ East of Greenwich), in latitude 45° 38′ 30″ N. No great confidence can be placed in the late attempts to ascertain barometrically the difference of level between the Caspian Sea and the Lake Aral. It is very possible, that the surface of the latter, like the former, lies below that of the Black Sea. Laborious trigonometrical observations can alone lead to satisfactory conclusions in operations combining such small quantities; thus imitating the examples of George von Fuss, Sabler, and Savich, who, in October 1837, successfully completed similar operations between the Black and Caspian Seas.

The following hydrometric measurements serve to fix the position of the Lake Aral:—

In the parallel of 45° N. lat. the Lake Aral is distant from the Caspian Sea.....	242	versts*	= 160 miles.
Orenburg to Mount Airuk (Lessing's Letter)	350	,,	= 224
Mount Airuk to the Lake Aral (N.E. end)..	450	,,	= 300
Irgiz to the Lake Aral (Witsen, p. 698).....	280	,,	= 186
Mouth of the Emba to the Lake Aral (Witsen, p. 697).....	250	,,	= 166

Meyendorf's journey from Orenburg to Bokhárá is also hydrometrically measured, according to which the North-East end of the lake is laid down on the map.

The true position of this predatory state is very uncertain, as in a march from Orenburg, mistakes in the reckoning of a day's journey may frequently occur. The sketch of a map in General von Gens's account, 1839—according to Kovyrsin's date—can scarcely be of much use in elucidating the truth; and still less do all the itineraries which we have consulted agree in fixing its true position. Wahl, Strahlenberg, Maas, and others, are also equally unsatisfactory as to the precise situation of Khivah.

* Hydrometrical measurements at level stations in the winter 1825–26.

Places.	Latitude, N.	Longitude, E. of Greenwich.	Authorities.
Khivah (*continued*).....	41° 37′ 0″	61° 3′ 24″	Meyendorf's Map. 1826.
	40 30 0	61 38 15	Hanway's Map. 1774.
Alvák	39 20 0	97 50 24	Orientals.
Urgenj.....	42 18 0	.. .. ..	Jenkinson's Observations of the Polar Star. 1558.
Kórkánj	42 17 0	96 50 24	Ulugh Begh's Tables. 1450.
U'rkánj or Yurgán.....	42 0 0	100 50 24	Orientals.
Khwárezm	42 45 0	86 25 24	Abúlfedá.
Urgenj.....	42 25 0	59 50 24	Kyrillov in d'Anville's Map, in Astley's Collection.
Great Kórkánj	42 30 0	86 22 24	Witsen, North and East Tartary.
Little Kórkánj	42 2 0	86 25 24	Witsen, North and East Tartary.
New Kórkánj	42 35 0	98 5 24	Ulugh Begh.
Khán Urgenj	39 50 0	.. .. ..	Bentink.
	41 25 0	55 20 24	Lapie's Map.
Házárásp.....	40 30 0	87 40 24	Orientals.
	41 0 0	.. .. ..	Orientals.
	41 0 0	97 20 24	Abulfeda.
	41 10 0	87 40 24	Witsen, p. 480.
Kat	41 36 0	87 20 24	Witsen, p. 480.
	41 36 0	86 20 24	Orientals.
	40 38 0	97 20 24	Orientals.
Dargán, or Khirik.....	40 30 0	88 45 24	Abulfeda. The Dehání Shír (Lion's Mouth).
	41 0 0	97 20 24	Ulugh Begh.
Zamakhshar.....	41 45 0	86 50 24	Allebáb, in Witsen, I. p. 480.
Kómkend	42 50 0	99 50 24	Orientals.
Kiz.....	43 50 0	99 20 24	Orientals.
Táshkend on the Wadí Eskár.....	43 10 0	87 40 24	Abul Hasen, in Witsen, I. p. 495.
—— reduced longitude	.. .. ..	62 50 24	
Karáa Tepeh.....	45 52 0	.. .. ..	Meyendorf.
Mouth of the Sir (Jaxartes)	46 25 0	61 20 24	Eichwald, p. 183.
Mouth of the Kuván Daryá	44 52 0	.. .. ..	
Bokhárá	39 43 41	64 28 24	According to Burnes' Map; 64° 25′ 24″ according to Elphinstone's Account, 1839. XXII.
	39 32 0	64 54 24	Meyendorf's Map.
	39 50 or 48	.. .. ..	Voyage, p. 126.

LONGITUDES.

Remarks.

14° 50′24″ East of Kazan, which is in latitude 46° 47′ 9″ (A. von Humboldt's Tables). The longitude of the Orientals is reckoned from a first meridian, drawn through the Fortunate Isles, the situation of which is unknown.

59° 0′ 24″ East from Peking, which is reckoned to be 114° 10′.

Seven German miles (28 geographical miles) distant from each other.

These several positions, according to the Asiatics and those placed on the maps, are no further valuable than as they give a view of the relative situations of one place from another. As the difference in the latitude of Urgenj, as laid down by Jenkinson and Ulugh Begh, is but one minute, it has been placed on the map in 42° 17′ N.

Little confidence, however, can be placed in Jenkinson's observations, when compared with the true positions of known places.

	Jenkinson.	True position.	
Kazan.....	45° 0′ N.	55° 47′ 56″	Alexander von Humboldt's Tables.
Astrakhan...	47 9	46 21 17	
Caspian Sea..	46 7 Where?		
Mangishlav ..	45 0	44 30 0	Kolotkin, Eichwald's Map.
Urgenj.....	42 18	42 17 0	Ulugh Begh.
Bokhara.....	39 10	39 43 41	Burnes.

The same author places Bokhara* in 86° 55′, whilst Burnes fixes its position in 64° 25′ 24″; so that the reduced longitude 62° 50′ 24″, would give the situation of this Tashkend south of the Delta of the Sir. May not Yárkend be here meant?

The Lake Aral is 280 versts broad (184⅔ miles) Witsen, p. 698.
At one place .. 60 .. ?

* Since the position of Bokhara has been determined by Meyendorf and Burnes, the longitudes of the Asiatics, by reducing them to that place, may be sufficiently depended upon as applicable for Central Asia. By this reduction, a difference of only 10 minutes is found, in comparing the accounts given by the Jesuits and Asiatics, of the position of Khojend, Badakhshán, Káshghar; and though these results may arise from mere chance, they will afford me great assistance in the construction of a map of Central Asia, which will shortly appear, with the above-mentioned comparisons.

II. MAPS AND BOOKS USED AS AUTHORITIES.*

Levshin's map, 1831, belonging to a work not made use of, the French translation not having yet arrived in Berlin. The routes taken from it, apparently grounded on accurate "reconnoissance" and routes of caravans, are traced in ruled lines.

General von Gens's construction of the territory of Khivah, completes this map.

Baron von Meyendorf's map, Paris, 1826, which was compiled from the journeys of eminent travellers, under the direction of Colonel Lapie, in Paris, is an important document, and by far the best then published.

Eichwald's map, 1834, is founded upon Kolotkin's atlas of the Caspian, 1826, which gives the best representation of that sea. It accompanies the periplus and a monography, containing a history of that sea.

Large map of the Russian Empire, in 75 sheets, 1823, in which no notice is taken of

Arrowsmith's outlines, 1814.

Muraviev's map, 1824, attached to the German translation of his Travels.

Weiland's map, 1832, is a compilation from various authorities.

Maps in Hanway's Travels.

Kyrillov's D'Anville's map, in Astley's Collection.

Helmersen's map of the Southern Ural, 1831.

Kruse's map to Göbel's Travels, 1837.

Pallas's map of his Travels in several Provinces of Russia, in 1773, published in 1776.

The works of Wahl, Von Zach, De l'Isle, Reichard, Berghaus, Dubrowin, Wahlenberg, Maas, Homann, Wit,

* I am indebted to the Royal Library for the use of these books, so far as the rules of the establishment permitted it. I therefore deem it my duty to acknowledge my thanks to the gentleman to whose charge the library is entrusted.

a printed copy of Witsen's map, Strahlenberg, Rychov, in Büsching's Collection, vol. vii., Falk, Ste. Croix. All these have been examined, and made use of as far as they were available.

Some of these books have furnished lines of routes, which are marked with different characters.

Carl Ritter's Geography, 1818, vol. ii., describes two caravan routes, taken from Ehrmann's Appendices, which take notice of the commercial road of the Seres.

In Müller's Collection VII., and Falk's Appendix I. 394, the march of Bekevich is described.

The appendix to Falk's Supplement gives the only detailed account of the direct route from Orenburg to Khivah.

Rychov's important route has been introduced from Büsching, for the sake of reference.

Hanway's account gives unfortunately no detailed description of the road, but he takes notice of the line of march of the Orenburg expedition in 1771, and Thompson's route in 1741.

A History of the most remarkable geographical discoveries up to the year 1542, by Sprengel, published at Halle, 1792, includes Pegoletti's route.

Witsen's North-east Tartary, contains a route by—

(*a*) The Isthmus of the Turkomans.
(*b*) From Khivah to Bokhara. (The best, but now lost.)
(*c*) From Mesh-hed to Khivah.
(*d*) Jenkinson's Journey, 1558.

} Compare also Ritter's Geography.

Meyendorf and Muraviev are those who have given the most satisfactory descriptions of routes.

Finally, some lines of roads have been taken from De l'Isle, Maas, and Arrowsmith; and the routes of Falk, Pallas, Göbel, and Arthur Conolly, are partly included within the limits of the map.

The line of march of the present Russian expedition, so far as it is known to us, is traced with a green coloured line.

The marches of Tímúr, Abú-l Ghází, Nadír Sháh, can only be drawn satisfactorily after a series of correct astronomical observations in the neighbourhood of Khivah shall be made known.

All the Itineraries mention ruins.

All the routes are adapted to those of Levshin, Meyendorf, Muraviev, and are traced without alteration.

The result of these communications affords the choice of a line of operations, in the event of a military expedition from the Ural against the countries to the south.

To attack Khivah from the north four routes are available:

(1) By an expedition on the Caspian, as was attempted under Peter the Great, by Prince Bekevich, in 1715, namely, to land in the Balkan Bay, and pursue the route which Muraviev took in 1819.

(2) The old caravan roads from the lower Ural to the delta of the Amu, upon which Bekevich did in fact advance in 1717.

(3) Upon the east side of the Aral, nearly on the same road which Meyendorf followed on his route to Bokhara.*

(4) Upon the west bank of the Aral, through the Isthmus of the Turkomans, between the Aral and Caspian Seas, either by crossing the high plateau of the Ust-Urt, or skirting it by the coast of the Aral.†

Though the eastern route is supplied with wells, the passage of the Sir-Daryá‡ (the great Jaxartes of the

* According to Marsden, this was also the route of Marco Polo.

† This route has been chosen for the present expedition.

‡ The Sir, at its mouth is 60 toises = 120 yards broad, and 15 versts higher up, 120 toises. Its stream is rapid, and navigable from Khokand.

ancients) presents difficulties in a military point of view, which however might be overcome. But besides this, the expedition, before it reached the central point of the Khivah territory, would have to pass the river Amu (the Oxus* of the ancients), and probably in the face of the enemy, who would have it in his power to offer a very formidable opposition.

It was upon the western roads on the isthmus that General Berg made his military "reconnoissance."

As the isthmus is wholly without water, the winter, when the snow is deep, is the most favourable season for a march on the west side of the Aral.

The thermometer upon the Isthmus of the Turkomans, from the end of November to March, is known to be often as low as $-25°$ to $30°$ of Réaumur, and at times many degrees lower.

The distance from Orenburg to Khivah is much the same as that from Berlin to Naples, namely, about 600 English geographical miles in a direct line.

Upon the western entrance of the isthmus in a fiörd, which is connected with the "*Dead Bay*" (Mertvöi Kultuk), and is called Tiyúk Ḳará-sú, the Russian government some years ago established a fortified commercial depôt, Novo Alexandrovsk, which is given on my map.† This establishment was entrusted to Major von Karelin, who has deserved well of science for his researches and formation of a collection of natural history, during a long abode in Orenburg and among the Western Calmuck-Steppes. The Khán of Khivah, following the footsteps of his forefathers, not only pursues the same system of traffic in slaves and plundering pass-

* The Oxus is 200 toises = 600 yards broad. (Muraviev gives it as 600 paces.)

† In the territory of the Upper Emba, near to Ati-Yakchi and Ak-Búlák, fortifications, according to the latest accounts, have been established and occupied by troops.

ing caravans, but has also endeavoured to bring under his yoke the Southern Turkoman tribes, as far as the Persian frontier; and in the year 1832 he advanced, with a considerable force, to Merv. According to Sir Alexander Burnes' account (Travels into Bokhara, vol. ii. p. 385), the distance from Khivah to Merv, is fifteen days' march. At that period the Khan of Khivah established a custom-house at Sarakhs, only three days' march from Mesh-hed; and still later, he has taken a part in the affairs touching the Persian siege of Herát, his political and religious interests being in direct opposition to those of the Persian government. The distance of Khivah from Herat is above 400 English geographical miles, and from Khivah to the Hindú-Kúh, the western range of the gigantic Alps of Upper Asia, is 600 in a straight line.

Note. In any expedition to invade the eastern division of Upper Asia, a landing must be attempted on the rugged coast of Mázanderán. In a military point of view, Asterábád is the most favourable point, but it is situated several miles inland, on a shallow branch of a large but not deep bay. (Compare Kolotkin's Atlas and Sutherland's Map.) The south coast of the Caspian is, however, of much importance on all accounts, from its trade with Persia, its silks, and in the produce of its forests and fisheries. We may here give the information contained in Björnstierna. (See the British Empire in the East Indies, 1839, p. 293.) "Russia has not more than eight or ten small corvettes on the Caspian; and her whole merchant fleet there consists altogether of from thirty to forty undecked boats: it is, therefore, quite impossible that with these means she could furnish transports for the smallest corps-d'armée." Possibly a fleet of transports might be built at Kazan and Astrakhan, where there is no want of ship timber; but this is an extensive and costly operation, which requires the labour and preparation of many years. We need not, therefore, trouble ourselves about such a fleet before it is built. Nor would there be any sailors to man it.

Note. Jenkinson's Route, as it is very well given in Witsen's

North and East Tartary, and as Eichwald also has understood it, gives rise to an observation, which is not followed out in the annexed map, although it appears to be confirmed by other accounts. This is not the place to enlarge upon the question on the form of the Caspian Sea, and the early existence of the Aral Sea in the times of the Greeks and Romans: questions which have been fully treated by Bayer, D'Anville, Ste. Croix, and in later times by Dureau de la Malle and Professor Eichwald, of Wilna. In ancient times, and during the middle ages, much was said and discussed on the question, whether there had been any connexion or not between the Caspian and the ocean. In the same manner, since the comparison of the mean barometrical heights of Astrakhan and Petersburg, and the two contradictory barometrical levellings, one by Parrot, in 1811, the other by Engelhard and Behaghel, in 1829, the relative heights of the Caspian and Black Sea have occupied general attention.

Herodotus and Aristotle (in the first book on Meteorology, cap. 13,) were the first to assert distinctly that the Caspian was an enclosed sea, and had no connexion with the ocean. The erroneous notion that the Caspian was a gulf, was generally entertained at a later period, though it is mentioned in the fragments of Hecatous. The passage in Herodotus (I., 202), which describes the Araxes (the Jaxartes or Sir) as emptying itself by forty mouths, all of which, with one exception, were lost in swamps and marshes, has been referred to the Lake of Aral. Another passage from Strabo, which has often been quoted (lib. xi. p. 512, Cas.), to the effect, that "the country of the Massagetæ is watered by the many-channelled Araxes (Jaxartes), which empties itself by many mouths into the Northern Sea, and with one only mouth falls into the Hyrcanian Gulf," is very little to the point. The Arabians, Ebn Haukal and Edrísí, in the tenth and twelfth centuries, were acquainted with the name and position of the Aral Lake. In the portion of the "Geographia Nubiensis," which has never yet been published either in the original or in any other tongue, Jaubert finds the following words: "The elevated ridge of El Kám bounds the shore of the Caspian Sea, and touches the Aral Lake, and further on it is connected with the mountainous range of the Ferghánah." (Geography of Edrisi, 1836, tom. i. p. 336.) The celebrated monk from Brabant, William Ruisbroek, who travelled

in Asia eighteen years before Marco Polo, and crossed over the southern slopes of the Ural, through the country of the Pascatir (Bashkirs), probably therefore by Guberlinsk, was the first to revive the credit of the correct opinion of Herodotus, Aristotle, Diodorus, and Ptolemy. He relates that the Volga (Ettilia) and the Yaik, or Ural River (Yagag), flowed into a lake called Ettilia, whose circumference was a four months' journey. (Humboldt, Examen Critique de la Geographie du 15me siècle, t. i. p. 71; t. ii. p. 319.) Marco Polo also (1271—1295) says: "The Sea of Baku (Mar di Abbacu) is like a lake, for it mixes its waters with no other." In the old map of the Marino Sanuto (1323) two Caspian Seas are laid down; one of which, called *Mare Yrcanum*, or de Sara (from Saráï, the winter residence of the Mongols), is said to be without an island, and to be connected with the Mare tenebrosum of Eastern Asia. The other Caspian Sea is land-locked on all sides. Now will this double sea, described also by the Cardinal d'Ailly, satisfy at once the two opinions, or is the hypothesis connected with the knowledge of the Aral? (Bayer, Acta Petropolitana, t. i. p. 398.) D'Anville and Ste. Croix recognise the Lake of Aral in the lake or swamp of Oxus. See Ptolemy and Ammianus Marcellinus (Oxianus Lacus and Oxia Palus), (Ste. Croix, Examen Critique des Historiens d'Alexandre, ed. 2me. p. 697—724. Historic Notes by Ludwig Ideler and Alexander von Humboldt on the Meteorology of Aristotle, t. i. p. 470 and 500.) C. Ritter, on the other hand, Klaproth, Droysen, and others, insist that the Oxus Lake must be the insignificant Karáḳúl, in which the Kohik or Zarashan (the Polytimetus of the ancients), which flows by Bokhara, loses its waters. Menn is also of this opinion in his work on Alexander's Expeditions on the Oxus (Carol. Menn, Meletematum hist. Specimen duplex 1839, pp. 72—77). According to the editions of Ptolemy, which I have examined, the longitudes and latitudes would give to this lake a position between Zariaspa and Trybactra, the former of which answers to the more recent Fáráb, or Farbar; and the other to old Baïkand, of which there still exist splendid ruins.

We now proceed to draw certain conclusions from the preceding remarks, first making a short review of the country of the Oxus.

(1) Abulfeda places the position of Khivah on the south-east shore of the Caspian.*

(2) Jenkinson travelled in 1558 from Mangishlak on the Caspian, in the 45th parallel of latitude,† to Urgenj. The following account is given in his journal:—

The caravan, consisting of 1000 camels, set out on a 14th, and arrived after much fatigue.

From the 14th of that month to the 5th of October, we refreshed ourselves on a gulf of the Caspian, and arrived,

From the 7th to the 9th of October, at Sellizur;

From the 14th to the 16th of October, at Urgenj;

From the 26th of December to the 7th January, at Kait;

And finally reached Bokhara on the 23rd.

The journey therefore, from the gulf of the Caspian to Urgenj, was performed in six days.

(3) Gurski, moreover, navigating the Caspian in 1668, fixes the position of Sellizur at two days' march in a northern direction (?) from Urgenj. (Witsen, p. 702.)

(4) From Kazan on the sea-shore to Urgenj 220 versts= 31·5 German miles (126 naut. m.) (Witsen, p. 699.)

(5) Khan Urgenj, from the borders of the Caspian, 25 German miles. I have omitted to take a note of the source of this information.

(6) Olearius, 1663, mentions the great breadth of the Caspian.

(7) Abulghazi (p. 323) speaks of the mountains of Abúlkhán and Mangishlak; but they can scarcely have been situated on the Caspian, as he so positively asserts in page 211. May not these Abulkhan mountains, where the tribe of Takahs reside, be identified with the Balkan mountains, which bound the gulf of that name, and where the tribe of Yamuds wander? However, in the last passage in Abulghazi's account, there is ground to

* Abulfeda, in Hudson's Geography, vol. iii. p. 18. Upon Mount Yernék, in the neighbourhood of Bilyulv Ata, there stands an inclosed building, having a portal or large door, and in the yard a mosque, and several apartments of massive construction. The whole building is composed of brickwork. Near the door is a well 30 to 40 fathoms deep. It is said, that on a fine clear day, the Caspian and Aral Seas can be plainly distinguished from this spot; and it is further reported that in former times, boats coming from Astrakhan landed at the same place (where the above ruins are still seen), discharged their cargoes there, which were thence transported overland to the Aral Sea, where they were reshipped for Khivah, or other distant lands. (Rychov, Büsching, vii. p. 95.)

† 44 deg. 30 min. according to the latest computation.

assume that the Oxus, in the year 1640, flowed into the Caspian, when its waters may have been nearly on the same level that they are found to be in the present day.

(8) There can be no doubt that these countries lie low, if it be true that Kunduz has only an elevation of 500 English feet = 78 toises.*

(9) Dubrovin found water in detached places in the bed of the Oxus, which are now dried up.

Muraviev, in 1820, was only able to recognise the course of the river, by its banks and mulberry trees.

All other notices, however, imply a doubt that, before the middle of the sixteenth century, the Caspian was 280 geographical miles from Urgenj. They all agree in repelling the notion of so great a distance. With such testimony, then, we cannot resist venturing the conjecture, namely, that the waters of the Caspian may have worked for themselves (perhaps two or three degrees of longitude eastward) a large gulf† towards Urgenj, such as, for example, an extended Kara-Bughaz. Muraviev, the only European who has travelled in these parts, and given any information upon the subject, found the old boundaries of such a bay. We have only to suppose the depth of the water, in former times, to have been very shallow, in order to conceive the possibility that a desiccation may have been brought about by the advance of the desert-sand, the action of the sea, and the flow of the arm of the Oxus bringing quantities of drift-rubbish and sand along with its stream. Though indeed on the west coast near Kislär, and in other places, phenomena have been observed which might lead to the conclusion that the Caspian has formerly stood at a somewhat lower level, this cannot have been of much importance, and may probably have been only periodical. The Turkoman deserts must, therefore, have been very near upon a level with the Caspian.‡

* Asiatic Journal, November 1838. Asiatic Intelligence, p. 162.

† The remains of the Scythian gulf, according to Mela (?). The view of it from the three bays of the Caspian, namely, the Caspian, Hyrcanian, and Scythian, is sublime and imposing.

‡ This is not a rash conjecture, because we know that in Egypt, tracts of land are found to lie below the level of the sea. This is also the case in Holland, where the depression of the land is still greater. Even now, the depth of the sea in the Balkan gulf has perceptibly decreased according to Eichwald's testimony.

The early notices of the outlet of the Oxus into the two inland seas having been navigable, are rendered more probable by supposing them to have been less distant from each other in former times than at present. (Compare Cancrin's Memoir.)

Under the present circumstances, a divergence (bifurcation) of so wide an extent and duration, produced by drift sand, of a river of no extraordinary volume, such as the Amu, would be a solitary instance of the kind; and that the only cause of such a divergence ceasing to exist, should have been an embankment, is justly doubted by Karelin.

It is much more credible, that in consequence of a receding of the coasts this divergence has ceased. The sandy bottom of the sea becoming dry, and thus changed into a desert of drift-sand, would soon become the grave of the river already exhausted by the canals formed by the people of Khivah. There could have been no history of these deserts before the sixteenth century. What accounts have we of that country before that period?

South of this barren tract, are the valleys of the northern slopes of Khorásán, of which country we have many accounts. The early oriental writers extol and magnify the character (similar to that of the more western Mazanderan) of the surrounding districts of Abíwerd, Sús, Deregez, Nisá, or Nasaï (Little Damascus), as being capable of the highest cultivation. This early flourishing state of nature may have been annihilated by parching desert winds, in later times, sweeping over the land, and burning up the verdure of the valleys, which before had been rendered fertile by the northern sea breeze. But a more disastrous enemy accompanied the desert wind: the wandering Turkoman tribes carried devastation and destruction into the now wasted country along the foot of the hills.

Here it is also worthy of remark, that all the other borders of the great deserts of the Oxus appear to have, in a measure, receded; for instance, towards Serakhs, Merv, Maïmúnah, Balkh Karshí, Farab (the once flourishing Zariaspa),* towards Bokhara, Baikand (formerly the splendid Trybactra), near Zamín, and about Khivah. It may further be questioned, whether tributary rivers did not fall into the Oxus below Balkh, perhaps

* The sea is observed to have receded in this place. There are abundance of such appearances on the Caspian, the Emba, Sagis, Tantachur, &c. Witsen, p. 382.

the Chekedalik, that from Karshi, the Kóhik, those of Balkh, and Andekhó, Merv, and Mesh-hed-Herat. Or did this last one, under the name of Ochus, flow into the supposed easterly elongation of the Caspian?

A further examination of the mouths of the rivers discovered in the Balkan gulf, is as much to be desired as a general survey of the whole district between the Caspian and Khivah. The remains of shells, which have been noticed by Bekevich, Soïmonov, Bruce, and Arthur Conolly, might perhaps afford some clue as to the length of time the sandy bottom has been laid dry.*

The history of great rivers must, according to modern geological theories, show their different periods of change in respect to their duration and form, as well as to their course and volume.

The Oxus could only have originated after the elevation of the mountain whence it has its source. Where was its mouth in the ante-historical time? — when, for example, the great northerly low lands of the old world were probably covered by the ocean?

There is reason to suppose, from the information we possess, that the Oxus formed a great delta with the Kizil and Jaxartes, at the time when the Aral and Caspian were connected, and this latter sea probably with the Black Sea.† (Herodotus, Strabo.)

At a later period, the Oxus flowed into both seas, where they could not, as at present, have been six degrees of longitude asunder. (Jenkinson.)

Subsequent to this great distance between the two inland seas,

* Mention is frequently made of the elevation of the land in the great Caspian hollow (see Pallas, Ritter, Muraviev, Eichwald, &c.), which may have served to strengthen the notion of the disappearance of an expanse of water, always very shallow. The Islands in the Caspian have, in some places, been very perceptibly raised. In some spots they now form part of the main land; whilst others, ercently formed, have appeared. The depths of the sea are constantly and rapidly changing. A comparison of old maps delineating the mouths of the rivers, with more recent surveys, leads also to the idea of an elevation. We shall soon be well acquainted with their present state, as, in pursuance of the recommendations of Baron von Humboldt, iron marks have been placed on the rocky shores of the Caspian, at certain fixed distances from the mean level of the water. Many causes combine to effect alterations on the coast.

† Pallas' remarkable line for ascertaining the old shores of the Caspian is marked upon the map. When will another Pallas attempt to carry it on into the district of the Oxus?

one arm of the river must, some time or other, have fallen into the Caspian near Mazanderan. (Abulghazi.)

We find in the last and present periods that this river discharges itself by many mouths on the south coast of the Aral, which is probably indebted to its waters for its clear blue surface, comparatively free from islands.

There are few good accounts of the Túrán countries which surround this important river, and these are often involved in mystery.

III. REMARKS ON THE HYDRO-OROGRAPHY.

The lines of the coasts are drawn according to Kolotkin, Eichwald, and Levshin. The shores of the Caspian are still subject to slight changes, except where steep cliffs (rocks of recent formation) intervene. It is here where landing-places are found.

Proceeding from the Ural-delta westward, islands of sand, and bare of vegetation, are scattered along the coast; in the delta,* and to the eastward, islands covered with reeds are found in front of the swamps of the shore.†

The sand-hills of the Barzuk continue along the north-west shore of the Aral as far as the Kuk Ternak. The Ust-Urt raises the western coast to an elevation of 100 toises, or 600 feet; whereas the southern and eastern coasts are low, and receive the numerous branches of the Oxus, as well as the principal streams of the Sir and Kizil.

Levshin's map does not give the island Totamak;‡ but one called Barza Kilmez, which is probably fabulous, as he adds, that whoever lands there never returns.§

Several smaller lakes are scattered over the surface of

* Göbel's map referred to in this place.

† Examine Karelin, Lessing, and Rychov.

‡ Hemerslen, p. 3. § Ritter, 1818, p. 699.

ntry adjoining these two great inland seas. *A*
ngs of inferior rivers, which are as little worthy
e as the valleys through which they flow, are
t a greater distance.
alt lakes are situated at some distance from the
chains of the hilly country, south of the river
We agree with Eichwald, that the great salt lake
sthmus of the Turkomans can be no other than
ib Guskin.
lin speaks of the resemblance which the embou-
of the Sagis and Emba bear to inland lakes.
ow meadow land of the valley of the Ural, from
ownwards, exhibits several divergences of the
and branches which are now dried up.
Kamishlak, from its source downwards, like the
nd Sagis, according to the map of the Russian
, consists of a series of small lakes.*
in considers the upper affluents of the Ilek and
mba to be connected. Witsen may perhaps mean
e thing, when he says, "The river Ilees (Ilek)
t of the Oerok† (U'rok) or Indér, and claims
he same parentage with the river Temiren."
e phenomena are in keeping with the character of
country of inconsiderable elevation, as Alex. von
ldt describes it. The system of the Ural, there-
ly reaches great heights about the sources of the
that name, and far to the north; whilst its pro-
n south of the bend of the Yaik, near Orsk,
enetrates the neighbouring wooded heights, at-
aly a moderate elevation in a country rich in

of this description are found in the whole region of reeds. (Com-
's Geography.)
lition to these, the springs of the Arvies and Vór, or O'r, take their
he neighbourhood of Mount Airuk. The first flows into the Akbashli
s the east, the latter near Orsk in the Ural. The Airuk, in this
y be compared to the St. Gothard, the Fichtel range, the Waldaï,
ntain groups.

mines. Falk and Witsen give names to some inferior rivers of the Steppes, which are inserted in the map.

But we fear we have been detained too long upon the barren subject of hydrography; and therefore now turn to the consideration of the

Steppes—Mountains.

These are drawn on the map, in accordance with the general observations of Alex. von Humboldt upon the subject.

Three ranges of heights running nearly in a parallel direction with the meridian, compose the mass of the South Ural.

The Airuk is the St. Gothard of this low and flattened range of hills. This group, to the east, terminates somewhat abruptly in the more elevated plains and deserts of Turkestan, or what is now called Kirgiz. Single ranges of heights, resembling rugged and broken sand-hills, keep up the communication with the U'lú-táú (Great Mount). To the west, this hilly district is gradually lost in the deep valleys of the Lower Ural, the zigzag course of which is perfectly free. The whole hilly country is intersected by various ways of communication. Perhaps the general name of Airuk or Inder might be assumed as a southern boundary.*

We omit to notice separate peaks, such as the Ilek salt-hill, the Inderskoye gypsum-rock, &c.

Lessing mentions circular hillocks, or sand-hills, about the lakes; and the map of the Russian Empire† gives them also about the little Penjab, Bish-Tamak, on the Ilek.

The profiles are only to be considered as graphic repre-

* Witsen, p. 697. See above, and the east border of the Inder mountain, thirty versts from the Yaik. (Compare Pallas.) The Urok is ninety versts in length.

† This map gives the best representations of the Steppes. Most of the other maps have the southernmost, as well as the Centre Ural drawn too far advanced among the ramifications of the rivers.

sentations of our view of the country. It will take some time before A. Erman's section of the Ural can be completed.

The second more general group of hills is formed by the Ust-Urt. The relief is represented by a profile, from a barometrical observation; the results of which, however, may be disputed.

Witsen, pp. 697, 429, mentions Sju (Shú) and Jernäk (Yernék) mountain on the Aral; and Astley's Collection, p. 481, speaks of the Kuran, or Abulkhan mountain, and Dsu or Ju mountain, as being the northernmost of this range. (Jaspis?)

Both these elevations of the country would seem to be united about the sources of the Emba and Sagis. It is also to be remarked that the rugged western shore of the Aral, and the upper parallel of the valley of the Ural, lie in the same longitude. (See above, Orsk and the west coast of the Aral.)

The Steppes are confined within the limits of the above-mentioned heights; but though not accurately determined, from our imperfect knowledge of them, are probably not far from the truth.

Water may be found at no great depth; 2 to 10 toises? (12 to 60 feet). Fresh water is not rare (Eichwald, p. 199). The Arundo phragmites, found in the desert, announces that water may be obtained from 2 to 3 feet below the surface. (Falk, II. p. 109.)

Single heights on the lines of road, and insulated level steppes, are carefully inserted, where they are found on the banks of the rivulets,* among the South Ural heights, and on the Ust-Urt.

The surface of the Caspian is still below the level of all other seas, and the surrounding Steppes may also

* These streams have been termed coral or necklace rivers, in which a continued succession of lakes presents the appearance of a string of beads.

be below that of the ocean. It is to be hoped that these fruitful countries, fertilized by canals of irrigation, namely, those on the lower Amu, about Khivah* and the Aral, will soon become better known.

* Khivah may perhaps be defended for a time, by a skilful advantage taken of the ramification of its canals. The tactical use to be made of water lines is not unknown in that region. (See Bekevich's expedition; Timur's battles, in Abulghazi.)

The following Table of Heights is compiled from the Accounts of different Travellers.

Points Measured.	Toises.	Feet.	Authorities and Remarks.
Surface of the Caspian Sea	− 12.72 =	82	Trigonometrical survey by Fuss, Savich, and Sabler. I have to thank the kindness of Baron Alex. von Humboldt for these numbers, which are the more welcome, inasmuch as a fact, which has long rested in uncertainty, is now settled beyond a doubt.†
Orenburg	+ 39 =	249	Therefore, 51.72 toises (326 feet) above the level of the Caspian, according to accurate calculation. (Alex. von Humboldt.)
			55.7 t. = (357 ft.) According to Helmersen above Gouriev — Geognostic Researches, 1831, page 82.
			52 t. = (332 ft.) Above the surface of the Caspian, Ibid. 1831, page 80.
Kalmukovah.....	− 22 ? =	140½	From these data, Göbel assumes a considerable depression of the steppes in this latitude. The whole district immediately north of the Caspian is elevated but a few toises above its level.
Kamush Samarah Lake			Göbel's Journey, II. p. 200: a low and rich water basin.
Eltón Lake ..... only	− 3.12 =	19	Göbel, p. 218, Pallas, Helmersen, and many others.
Orsk	+ 91.7 =	582	

† When the great trigonometrical levelling between the Caspian and Black Seas was completed, a preliminary calculation gave a difference between them of 101.2 Russian feet, or 94.9 Parisian. This report spread rapidly throughout Europe in December 1837. Careful investigation of the effects of refraction has determined the difference of the level of these two seas to be 76.3 Parisian feet.—Compare Fuss, on "The Causes of an Augmentation of Errors which arose in the Final Result of the Geodetic levelling between the Caspian and Black Seas, calcu-

Points Measured.	Toises.	Feet.	Authorities and Remarks.
Khabarnoi	78.9 =	498	Helmersen's Researches.
Height between Khabarnoi and Guberlinsk	180.7 =	1204	Compare the valuable tables in Helmersen's Researches, and the barometrical level from Orenburg to Gouriev, pages 77 to 82, and Lessing's Observations, 1832.
Guberlinsk	77.1 =	492	
Kamelberg (Camel Hill)	149.9 =	1204	
Irendik, near Magnitaya	351.7 =	2244	
Aktúba	406.9 =	2595	
Peak of the Irendik, on the east bank of the Tolkash Lake	486.9 =	3107	
Highest point of the road between Khabarnoi and Guberlinsk	181.9 =	1156	1832. Lessing's Barometrical Observation.
	183.9 =	1169	1833. „ „ „
12 versts North from Guberlinsk	140.9? =	894	1833. „ Estimation.
Highest mountain close to the Ural	193 =	1233	1832. „ Barometrical Observation.
Al-Uruk or Airuk	166 =	1061	Above the Steppes—Lessing's Estimation. According to Eversmann, 800'.
Aral Sea	6 =	31	Or 18.3 toises (115 feet), above the surface of the Caspian.
Yéa concave, or convex crown of the profile of the Ust-Urt, in latitude 45°			Barometrical levelling station, winter of 1825–26.
	+ 88 =	562	The Ust-Urt has an elevation upon this line very little above 100 toises (639 feet.)
	102 =	651	Guberlinsk, 77 toises (492 feet.)
	101 =	643½	Kunduz, 78 toises (408 feet.)
	74 =	437	The Ust-Urt, therefore, might have
	101 =	643	been an island of the sea, when those
	90 =	575	points on the valleys of the Ural and
	101 =	643	Amu were still under water. (Compare
	91 =	581	the Chinese maps.)
	89 =	569	
	87 =	556	
Heights on the east bank of the Aral	36.6 =	230	*i. e.* 31 toises above the level of the Aral. (Meyendorf.)
Bokhara	188 =	1201	According to Burnes.
Balkh	281 =	1718	
Khulum	225 =	1437	
Kunduz	78? =	498	Lord, Asiatic Journal, November 1838. Asiatic Intelligence, page 162. The Oxus would, therefore, have a fall of only 72 toises (464 feet) from Kunduz to the Aral.
Sources of the Oxus in the Victoria Lake	2440 =	15560	Lord's account of Wood's measurement. Where is this source?
Mesh-hed	415 =	2652	Fraser.
Inderskoye Lake	— 8		If the Ural, by Inderskoye, is — 12 toises, *i. e.* 0.7 toises higher than about Gouriev.
Inderskoye Mountain-peaks	+ 20.2 =	127	Göbel's journey, pages 185, 186; therefore the Inderskoye mountain is 32.9 toises (204 feet) above the Caspian.
Chernoyar, on the Volga	— 8.2 =	51	Göbel, II. pages 185, 201.

lated according to the Method of Observation from the Mean," read the 31st August, 1838; and "Note sur les Causes de l'Effet de l'intégrale Réfraction dans la Mesure simultanée des hauteurs Terrestres; par G. Fuss, lue le 18 Octobre, 1838. Tirée du Bulletin Scientifique publié par l'Académie Imp. des Sciences de St. Petersbourg," T. V. N. 5.

The Russian expedition to Khivah, under the orders of General von Perovski, besides investigating the astronomical and geographical features of this terra incognita of the Sea of Aral and the countries of the Oxus, will also elucidate the geognostical character of the whole basin. The great north and south chain of the Ural Mountains, which lies between Guberlinsk (lat. 51° 8′) and the great mountain Denishken Kamen (lat. 60° 20′), only oscillates between 56° and 57·75 of east longitude, and may be said to disappear in the Isthmus of the *Turkomans*. It gradually becomes lower at the Airuk, where the bifurcation into the Mugojar and Western Urkach chain commences. The Ust-Urt, as an elevated plateau, the axis of which extending from south to north, is undoubtedly, with regard to its elevation, in connexion with the north and south chain of the Ural; but as far as we can judge from the few observations which have as yet been brought together, the mineralogical constitution and nature of the rocks are very different. The talc and chlorite slates, broken through by diorite and augitic porphyry which characterize the Ural Mountains, seem to disappear in the Mugojarian Mountains: the high plateau of the Ust-Urt belongs entirely to the system of the tertiary or newest sedimentary deposits. The strata in these are said to be almost horizontal, whereas in the Ural Mountains they are much inclined, and sometimes almost vertical. We shall only be hereafter justified in coming to any decision respecting the formation of the basin (or hollowed country), by a careful examination and classification of the petrifactions, the discovery of typical shells—the importance of which as zoological guides has been proved in such a masterly manner by Leopold von Buch. It is true a step has been already made in the neighbouring dis-

tricts, to clear up the uncertainty whether the horizontal beds of the Ust-Urt are tertiary or secondary sedimentary beds. "The little which we as yet know by zoological marks or characteristics, and consequently with certainty, respecting the nature of the sedimentary deposits in these most southern portions of Russia in the Kalmuck and Kirgiz-Steppes, is confined to this, that the Bogdo-ammonite (with toothless lobes) from the great Bogdo-hill, belongs to the Muschelkalk (shelly limestone), whereas the ammonites-jason, brought as a typical shell by A. von Humboldt and Gustav Rose from the little Kirgiz-Steppe (near the iron mine, Belosetsk), points out the existence of the upper part of the middle Jura beds. These determinations are the work of the great geologist, Leopold v. Buch*, who has also very lately recognised the Jura formation far to the north of the Ural (on the east side opposite the Soswa), by means of fossil petrifactions, which were communicated to him." To the south-west of the Ust-Urt commences a remarkable protrusion of plutonic, perhaps volcanic rocks, accompanied by naphtha springs, and mud volcanoes, which are called *Salses;* which bring to our recollection the *Absherán* fire-district of Bákú and the outbursts of Tamen. The information which Mr. Eichwald has already made known, in his Periplus of the Caspian Sea, respecting the geological connexion between the Bay of Balkan and the islands on the eastern coast of the Caspian Sea, has created the liveliest interest. The masses of black vesicular porphyries (or melaphyr) require to be carefully explored and distinguished.

* Also in the documents of the Berlin Academy of Knowledge, for 1837, p. iii.; and in the Description de trois planches d'Ammonites, p. 7.

IV.—PHYSICAL CHARACTER OF THE COUNTRY.

Remarks upon Minerals, Vegetation, Animal Kingdom, and Population.

However inconsiderable the ranges of hills to the south of the Ural may appear in their elevation, traces of important minerals have nevertheless been found in their lower heights.

Hardly anything but salt is found on the Ust-Urt, and Falk has made the interesting remark that the Steppes become freer from salt and saline plants, lakes and *kamishli* (reed-beds), in proportion as they rise. In the Steppes of the Oxus, moreover, gold is probably found, and certainly coal.

Minerals.	Where found.	Authorities.
Salt.....	The general extent of this important mineral affords another proof of the country having been formerly covered by the sea.	Compare the profile of Iletzkaya salt mount by Pallas.
	The Inderskoye salt lake. The people of Kirgiz procure salt from it, gratis.	Falk, II. p. 8—172.
	A salt mount near Iletzkaya. On the Upper Ilek.	Pallas, Göbel, and other authors.
	The Toyertoba salt mount on the left bank of the Ural.	Wisten, p. 697.
Coals, or, perhaps, Lignite	On the Berdianka. It is brown coal.	According to Eversmann.
	On the caravan road from Mesh-hed to Urgenj, near Kani Zogal, in the Inderskoye gypsum rock?	Ritter, II. 1818.
Gold and Silver*	Said to be always combined.	According to Witsen, p. 415. Muraviev, p. 71.
	In the Vasilikaya. But this is very doubtful, according to Helmersen.—In the Oxus.	Bekevich endeavoured to find the gold mines in this neighbourhood.
	Upon a mountain having a lake upon its summit, and situated on the Aral Sea.	Witsen, p. 481. Rychov, p. 473.
	Mention has often been made of it. In the Karatal Mountain.	Rychov, in Büsching, VII. p. 42.
	In the Sir.—Traces of gold on the Kamishlak.	
Jasper.....	In a ravine south of the Kamishlak.	Rychov, in Büsching, VII. p. 421.
	Orsk is partly built upon hillocks of jasper. Agate is also found there.	Falk, I. p. 189.
	Perhaps upon the Shu Mountain on the Aral Sea. In the mountains of Guberlinsk. On the Inderskoye salt mount.	Falk. Lessing.
Copper.....	On the Berdianka.	According to Meyendorf, Eversmann, and Pallas, I. p. 246.
	The mine is called Saïgacheï Rudnik. It was discovered by the Chudski Kopi, or Stari.	

* As silver never occurs in recent formations, it can only be found here in the same state as alluvial gold.

Minerals.	Where found.	Authorities.
Copper.....	On the Sagis and Turgai.	According to Falk, II. p. 71.
	Near Dislikenger. Khivah.	Muraviev.
	On the left bank of the Ural, in the Floetz rocks, running parallel to the Obchei-Syrt. 15 versts from Orsk upon an isolated hillock.	Pallas, I. p. 262.
Iron.....	On the Ilek and the Berdianka.	Meyendorf and Eversmann.
	On the Temir. Near Magnitaya. On the mouth of the Sir.	Falk, II. p. 82., III. p. 536.
Magnetic iron..	Near Magnitaya, of little value. Also lower down at the base of the Ural.	Falk, Rychov, (compare Erman's Journey.)
Clay slate	East of the Or.	According to Pallas.
Slates with Muscovy glass. (Mica.).....	Near Guberlinsk.	Falk, p. 189.
	On the Kamishlak.	Rychov, p. 423. Büsching, VII.
Gypsum	In almost all the heights of the Steppes, and in the Ust-Urt.	Falk, II. p. 29. Göbel.
	On the Iletzkaya salt mount, as also Selenite. Gouriev.	Falk, II. p. 19, and Rychov.
Petrifactions, Petrified wood, &c.....	On the Ural, elephants' bones at the entrance of the Delta.—On the Ilek.—The Mugojar Mountains.	Pallas, I. p. 419.
	In great quantities about the copper mines on the Berdianka.	According to Pallas and Eversmann.
	On the Ust-Urt. Sharks' teeth are found here. The shark is at present not found in the Caspian Sea.	Eichwald.
	It follows then that the remarkable remains of the old world are to be met with everywhere,* except in those mountains whose more modern existence is now ascertained.	
Marble.....	On the Gulf of Mangishlak.	Rychov, p. 423. See his Journey, 1771.
	85 versts from Orsk on the Kamishlak, there is an extent of 25 versts, called the Marble Stratum.	
Lime	In the Kirgiz-Steppes.	Falk, II. 19.
	30 versts from Khivah, in the desert. Pätniak.	Helmersen, p. 49.
Shell-sand.....	At the bottom of the Caspian, and in the Turkoman desert. 5 versts from the Balkan country.	According to Bekevich, in Müller's collection.
	The islands south of the mouth of the Ural are composed chiefly of shells.	According to Göbel.
Chalk.....	On the cliffs of the coast of the Caspian.	
Marl	Throughout the country.	
Native Sulphur.	On the Samarah, on the Sir. On the east coast of the Caspian, in those places where volcanic appearances are found. †	Müller's collection, VII. p. 30.
Alabaster.....	At the source of the Ural.	Witsen, p. 697.
Natron	In some of the lakes.	Falk, II. p. 6.
Alum.....	On the Ashu, Tashla-Kurgán.	Falk, II. p. 6.
	On the caravan road from Troitsk to Khivah.	
Naphtha .... Petroleum ... Maltha	Upon the island Chelekén.	Falk, II. p. 10.
	On the Samarah.	

* In Luxemburg, elephant's teeth have been lately discovered.

† It is certainly not old red sand-stone under the Zechstein, according to Baron Alex. von Humboldt's observation.

Minerals.	Where found.	Authorities.
Naphtha .... Petroleum ... Maltha.....	On the Irnek Mountain upon the boundary between Khivah and the Kirgiz-Steppes. In the Karakul on the Sagis. On the Kuturtas Mountain.	Falk, p. 52.
Quartz	On the eastern declivities of the Ural, near Sanarskaya, and in the Steppe, near Kundravi. On the Ural between Orsk and Orenburg. On the Kamishlak. On the Ust-Urt. In the volcanic masses upon Chelekén.	Rychov, p. 421, in Büsching, Magasin, VII. Eichwald, p. 23.
Pumice stone (red?)	On the Kamishlak.	Rychov, B. II. p. 421.
Pipe-clay.....	Near Guberlinsk.	Ritter's Geography, II. 1818. *
	Near Magnitaya, and also at other places.	Falk, II. p. 32.
Potter's-clay...	In Khivah, near the Khánkáh.	Eversmann, p. 49.
Red bole	On the Turgai. Near Orsk.	„ p. 34.
Granite	Near Guberlinsk in the bed of the Ural. In the Bashkir's Ural.	Falk, p. 39.
Coarse red, or yellow sandstone	In the Obchei-Syrt. Near Orenburg, to the north and east of Vyasovskoï.	Falk, p. 39, and the profile in Helmersen's Researches.
Soft red sandstone	On the Berdianka, or Deteralde, south of the Vyasovskoi. It contains the above-mentioned copper ore and petrified stems converted into splintry hornstone. In the Buluk Tau, and also in other places.	Eversmann, p. 7.
	Is this sand-stone,† found here, also placed horizontally like that in central Ural, in such wide extent?	Erman's Journey, I. p. 272.
Pudding-stone..	Abundant, on the Aral likewise.	Eversmann and Eichwald.
Vitriol	Irgiz.	Falk, II. p. 44.
Crystals and topases ...	On the Kamishlak, 25 verstas from Orsk.	Rychov, in Büsching, Magazin, VII. p. 423.

* Carl Ritter, 1818, vol. ii. p. 695, of his Geography, explains the occurrence of pumice stone by the hypothesis of a former flood, because in the present day seamen meet with it floating on the ocean in great quantities. See Dowe, in the Philosophical Transactions in the year 1728, p. 445. Flinder's Voyage to Australia. Cook's Third Voyage, and Krusenstern, II. p. 478.

† At Abishta on the Gulf of Mangishlak, on the Kara Bughaz, on the Balkhan Gulf.

Vegetation.

It may be remarked of the sterile and arid tract of country between the two depressed inland seas, that in it a limit is found to the extended growth of some important kinds of plants.

The following observations are most worthy of notice:

A great scarcity of Cerealia.

There is a great variety of saline plants,* of very

* Compare Göbel, II. p. 228, upon the plants of the region of salt.

peculiar properties, such as are found in the Inderskoye salt lake;* for instance, the Chorispora stricta,† those in the Solonchak salt plains, those on the Irgiz, and in many other places.

The Sáksáúl‡ (*Anabasis*) deserves especial consideration, on account of its being confined apparently within narrow limits, its importance as an object of fuel (an article particularly desirable in the Steppes), and also in regard to the erroneous notions which are abroad respecting it.

The exclusion of coniferous trees from small thickets and from woods of soft foliaceous trees.

The diffusion of reeds and rushes (rohr und schilf) § in the beds of rivers, and in the hollows of the Steppes (perhaps the remains of lakes after the receding of the waters of the sea), and on the coasts of both the inland seas. Rohr is mentioned on the Irgiz, on the Kuvan (Meyendorf, p. 57), on the Sir; and Schilf in the Barzuk, at the mouth of the Ural (Arundo phragmites), on the Chuï, and on the Aksakál. Islands of reeds float on the Aral. This plant carries the name of Schilf with it from the Karakul Lake to Karshi on the Oxus,‖ and on many of the small lakes of the Northern Steppes. The latitude of the centre of the Aral and the country of the Lower Sir, appear to be the southern boundaries of this pliant aquatic plant, which the inhabitants make use of in various ways. (Compare the northern zone of the "*reed lakes*" in the Steppes between the Ural and Volga.—Kalmukovah and Elton Lakes.—See Göbel's Journey.) These reeds are used for many necessary purposes,

* Ledebour's Journey, p. 230.

† Büsching, VII. p. 426. Rychov's Journey.

‡ Büsching, VII. p. 95. Rychov's Journey, p. 426. Eversmann's Russian Imperial Map. See the accompanying letters.

§ These two German words express nearly the same species of reed, in its earlier and in its more advanced growth.

‖ Sherefeddin's Life of Timur, II. p. 302.

namely: for covering winter huts, as the only article for fire wood, as fodder for cattle, and even for the construction of pontoons.

The poplar, namely the black poplar (populus nigra?), is so often mentioned by travellers, as might lead to the conjecture, that it is indigenous to the district between the Aral Sea and the Ural. Boats found on the Aral are made of this soft wood.* It is used for building houses and palisades on the Russian frontier; and hollow trees of this description are turned to account by converting them into bee-hives. The black poplar is also found in the valley of the Emba,† on the Sagiz, at Kamishla, in the neighbourhood of Orsk, Khivah, and Bokhara. The bridge over the Ural at Iletzkaya, and the ferry-boat on the Sir, are made of this wood.

Succulent and saccharine plants‡ are found about the ancient and present bifurcations of the Oxus, as at Sellizur, on the Balkan (Ogurza having the same signification as "the land of cucumbers"), at Khivah, and at Agathma. Jenkinson mentions the Dynié, Jegur, Carbauses,§ at Sellizur. May not the sugar plant, mentioned by Moorcroft, be found here likewise? The arbutus produces annually at Orenburg, and is used as a winter provision in Bokhara, according to Falk.

The limits of some of the principal plants are found to be as follows ‖:

(1) The northern boundary of the mulberry tree extends from the Balkan and Kara-Bughaz gulf, in the sheltered bed of the branch of the Amu, at Kara-ata and Olank on the road from Khivah, to Mangishlak ¶. The white mulberry is preferred at Khivah, because the silkworm thrives best upon its leaves. Khivah lies upon the route of the Seres. May not the silk merchants

* Falk, I. p. 101.
† Büsching, VII. p. 11 and 421.
‡ Muraviev, p. 12.
§ Kharbuzah, or Karpúz, *i. e.* the water-melon.
‖ Witsen, p. 416.
¶ Ritter, II. 1818. Rychov, Falk.

coming from the early-cultivated countries of Upper Asia have brought this valuable article with them? Does the mulberry tree still thrive at Mangishlak? In the garden of Orlov the Cossack, at Gouriev, there is a tree standing beside the Morus tartarica, which produces a fruit resembling the date, called Jida in Russian.

(2) The cultivation of fruit trees is, however, found not to thrive beyond Iletzkaya on the Ural.

(3) The poppy is mentioned as an article of cultivation in Khivah (Falk III., p. 500), Bokhara, and at Karshi. May not the limit of its efficacy for the preparation of opium be found in these parts?

(4) Citron and other evergreen foliaceous trees. The severe winters, when the large rivers are frozen up, following the excessive heats in Astrakhan and the country about the Aral, totally prevents the cultivation of the lemon tree there, which scarcely thrives at Rome. It appears that a mean annual temperature of 15½ to 16° centigrade, is in general requisite for the cultivation of the Citrus, which depends principally upon the mildness of the winter season, and the distribution of warmth throughout the different seasons of the year. In Rome, for example, the summer temperature is, however, 15°·46, according to the latest publication by Schouv (Tableau du Climat et de la Végétation de l'Italie, 1839, p. 146); the mean temperature being 8°·01, for an average of twenty years. The greatest cold in winter, observed on *single* days, according to Calendrelli, is from 5° to 6° below the freezing point. The olive tree, but not the citron, thrives in the warmest valleys of the Crimea.† In Sebastopol,‡ latitude

* Falk I. p. 176. The limits of vegetation under the parallel of 51° of north latitude, on the Asiatic side, by Canerin. See the different climates of Russia.

† Wild olive-trees at the mouth of the Usen, where it empties itself into the Kamush-Samarah, according to Göbel and Falk.

‡ Western Europe is much hotter. A table of the mean annual temperature, during summer and winter, shews this plainly:—

44° 37′ north, the mean annual temperature of four years, 1827 to 1830, was 11°·7 cent., and in winter +1°·4. The cheerful valleys of Nikita, Alupka, and Marsanda, though their winter may be somewhat milder, do not possess a climate suited to the production of the lemon. (Demidoff, Voyage dans la Russie Méridionale, t. i. No. 23, p. 360; and Göbel's Journey in the Steppes of Southern Russia, t. ii. p. 196.) It is, therefore, surprising how a species of citron, which is brought to market as the al toronjabín, could have thriven in Ferghanah near Zamin* (Abulfeda, p. 64; compare Ritter's Geography, II. 1818, p. 536), and that in Khokand the pistachio, and in Ak-su (lat. 40°·9 N.) cotton and the pomegranate could have been cultivated. It appears that the lemon was formerly grown in Khivah, and that it might now be cultivated with success there, if pains were taken to that end. This would certainly not be so remarkable a circumstance, as that the tender productions of the region of evergreen foliaceous trees, should thrive in the valley of Ak-su, which is certainly situated in a higher position.

(5) The cotton shrub does not generally thrive so far north as rice. Mention is, however, still made of it in Astrakhan; and in Inner Asia we have accounts of its

	Lat.	Annual.	Summer.	Winter temp.
La Rochelle....	46·9°	11·7° Centgrade.	19·2°	+4·8°
Padua	45·24	12·3	21·9	+1·7
Sebastopol	44·37	11·7	22·4	+1·4

(Compare Kämptz's Lectures on Meteorology, p. 227. These numbers are in progress of being more accurately defined by Mahlmann.)

From the observations of Göbel in the Septembers of 1834 and 1835, being years of moderate temperatures, we have:

	Lat.	Alt.	Annual.	Summer.	Winter temp.	
Sympheropol..	40°	132,8 toises.	7·5 Reaumur.	12·7	+3·2	Without corrections.
Astrakhan	46·21		8·1	15·25	+0·9	

If the numbers for Sympheropol be reduced to the temperature of the sea level, and the morning observations left out, we have:

Sympheropol	„	„	9·7	14·2	+4·8	Without corrections.
Astrakhan	„	„	8·27	15·3	8·27	

These results are, however, of little value. Compare Lotkin's Observations.

* Werner, Ebn Haukal (?) have also spoken of this citron. Witsen (page 364).

being cultivated at Khivah, Otrar, and Turkestán, Táshkend, Khojend, Marghilán(?), Samarkand, and in districts where rice is also produced. Gossypium herbaceum is also still cultivated with great success in the temperate zone as high as 40°, and even more to the northward; but generally in all places where the mean annual temperature oscillates between + 14·4 and + 12·8 of Réaumur, and where the winter temperature is not below 7°. (A. von Humboldt, de Distr. Geograph. Plant. 1817, p. 157.) If we compare this statement with Falk's account respecting the culture of opium in Khivah (Neumann's Observations, 1839: "mean warmth, necessary for the culture of the poppy, in order to prepare it for making opium, + 16° Réaumur"), and with the mean temperature of Marseilles + 11·7 Réaumur, where the cotton tree ceases to thrive, we may thence draw a conclusion respecting the climate of Khivah: but it must not be forgotten, at the same time, that the prosperity of both plants depends upon a great summer heat, whilst the severity of the winter is of less consequence. This season, according to the reports of Muraviev and others, must be very cold on single days (16° to 18° of Réaumur). In general, however, the winters are not immoderately severe, because no stoves are made use of, and the snow, which does not lie above four inches deep, seldom lasts more than four days. It is even more rare than hoar frost. The Oxus, indeed, occasionally freezes over entirely (Burnes and others), but certainly never for any length of time. There is every reason to believe that a curve, representing the climate of Khivah, would not only show great extremes of temperature, but frequent and rapid changes, indicated by points and sudden inequalities. Similar observations were made by the Prince of Neuwied, in the interior of the great North American plains, in the winter of 1838. It may be remarked further, that

the pistachio and pomegranate thrive in Bokhara. The latter only in Khivah! Are these the pomegranates of Samarkand and Ferghanah (Babèr?) It must be much warmer in Termed than in Khivah, because Timur* transported the arbutus from thence to the latter place in spring. Thus far may we be allowed to conjecture on the temperature of the atmosphere on the plains of Turan, from our knowledge of their vegetation.

(6) The vine† was cultivated by Sarts, in the district of Khayúk on the Lower Kizil, and red wine produced. Nazarov found wine at Tashkend. Murtazá says, that the vine grew also Khojend. Earlier mention is also made of it in Uzkend, and in all the cities of the plain of Ferghanah south of the Sir.‡ Göbel has inserted in his map the fruit garden of Orlov the Cossack, in which the vine thrives to perfection. (Part I., p. 121.) The northern limit of Persian cerealia and of rice, and the southern boundary of wheat, at the level of the sea, appear to coincide with the abovementioned line. In higher regions wheat is found in the aulengs (environs?) of Kábul, in the Tibet countries, in Cashmere, and Badakhshán. Mahometanism is seldom known beyond these boundaries.

(7) The Saksaul. It is evident, from the accompanying letters,§ that this tree, or species of shrub, hitherto little known, is an Anabasis. Meyer reckons it among the Chenopodeæns, having incorporated the Anabasis with that family.‖ (Compare Göbel, vol. ii. p. 301 and 217.) In a notice by the Writers on the vegetable productions of the Steppes (p. 42), Dr. Klaus confesses, that since the accounts of Pallas, Falk, Lepechin,

* History of Timur-bec, traduite par Pétis de la Croix. Paris, 1722.

† Abulghazi, Helmersen, Ritter, Baber.

‡ Witsen, p. 375, mentions grapes at Ichan, 15 wersts south of Turkestan.

§ Lessing has inserted a treatise in the Linnæa, b. ix. p. 145, showing the botanical harvest of his travels.

‖ Ledebour, Flora altaica. Berlin, 1829.

Tauscher, Eversmann, and Karelin, he has been unable to discover any new plants; particularly as the Caspian Steppes have been again more recently and accurately examined by A. Bunge, Karelin, Ludwig, Lessing, and Karin. Meyer (Ledebour, Flora Altaica, p. 347,) gives a sketch of the family of Chenopodeæns, with a history of all the different species. The following is his own report of the Saksaul, which I have here inserted, in order to meet all doubts on the subject.

ANABASIS AMMODENDRON. C. A. MEYER.

Anabasis arborescens, ramis ramosissimis aphyllis calycibus fructiferis quinqueleatis. (Ledebour, &c. p. 47.)

Pinus orientalis. (Falk's Topographical Supplement, II. p. 260.)

Tamarix forte songarica. (Eversmann's Journey to Bokhara, p. 48 &c.) Appendix, p. 116. Saxsaul.

Saxaul, Soksaul, Sexaul, Saksugul, Rossis, Kirghisis, Tartaris, Bucharis, Chiwinzis, Calmuccis.)

Invenimus arbusculam hanc memorabilem in arenosis ad lacum qui Noor Saisan vocatur (M). Crescit etiam in arenosis Buchariae inter. fl. Kuvan Darja et Jan Darja (Eversmann); nec non ad lacus Aral, Alakul, Taschkili, Balchasch et arenosis trans fl. Tzuja (sic!) austrum versus fl. aestate in desertes.

Arbuscula 12—14 pedalis saepe tamen humilior, trunco 6—8 pollices crasso. Lignum cinereum praedurum ponderosum. Cortex trunci flavescens, laevis; ramorum albidus. Rami ramosissimi, coarctati. Ramuli annotini articulati, aphylli, filiformes, teretes, elongati, simplices, herbacei, virides, demum inferne lignescentes, Articuli breves 1—2 lin. longi, aequales, ad commissuram lanuginosi, apice membranula marginati et dentibus 2 brevibus acutiusculis coronati. Ramuli annotini e commissuris articulorum inferiorum emittunt flores 2 oppositos minutos (granulo papaveris paulo majores) hermaphroditos bibracteatos. Bracteae minimae, orbiculatae, oppositae, laterales, languinosae. Sepala 5, suborbiculata, obtusa, hyalina, basi lanuginosa, omnia demum dorso ala magna semiorbiculata scariosa cincta. Stamina 5, receptaculo inserta, calyce longiora. Antherae flavae. Squa-

mulae hypogynae minimae, lanuginosae. Stigmata 2, brevissima, conica. Utriculus compressus, parum succulentus, sepalorum alis obtectus. Semen verticale exalbuminosum; integumentis tenuibus. Embryo spiralis. Radicula dorsalis.

Interdum casu quodam fortuito (an Cynipis morsu?) ramuli annotini articulis suis constipatis brevissimis et dentibus articulorum ampliatis foliaceis ovatis acuminatis bifariam imbricatis strobilorum quasi effigiem produnt, strobilo florifero Pini omnino non absimilem, proinde celeberr. Falk, stirpem Pini speciem esse contendit.

A. Eversmann l. c. calyces fructiferos alatos flores femineos esse putat et ramulos annotinos folia articulata dicit!

Eversmann informs us that the wood sinks in water; he also gives some remarks upon the practical uses to which it may be turned. General Gens says, it can only be broken, not cleft.

P. 67. The low hills on the Kosi are covered with woods of Sal-Saul; among which some species of the Dalbergia Sis are found. Higher on the mountains in the north, various pines (pinus longifolia) are found, called Sálla by the Hindú mountaineers.

P. 17. From Serinugur to the Teesta, and eastward, various sorts of trees, for example:—the very useful Saul, Sissoo, Settisaul, &c.

P. 35. On the chain of the Chiriaghati, the Sissu or Saul, in large forests.

P. 198. The plain of Hethaura has a rich soil, and is chiefly covered with noble woods composed of Sakuya or Sal, which are kept clear from underwood by burning the dry leaves and grass.

Hamilton, in his index, calls the Saul a Shorœa robusta; but in the text I have found no grounds for giving this appellation. Whenever the mountains of Tibet and Nepaul shall be thoroughly inspected, we shall be able to ascertain, whether the similarity of names, in countries where so many different idioms exist, is merely accidental; or if the Saksaul, migrating, in spite of the difference of climates, from the rich elevated valleys to the low barren Steppes towards the north, has dwindled from a mighty forest tree to a stunted shrub.

The south-east edge of the Ust-Urt, the plain of Khivah, and, perhaps, the Jengel (Desert) Steppes, south-

west of Khojend, and Asculat in its neighbourhood, are the southern limits of the Saksaul,* in the low plains of Turan. We may at least suppose it to exist in Kashghar and Yarkand. Its northern limit is partially fixed by Dr. Erman.

We give its wider extent as connected with the above statement.

(1) The Tumamie Gora, along the north-east coast of the Caspian, on the Caravan road from Gouriev to Khivah, in Lessing doubts whether it is found further to the westward.	46°	N. Lat.†
(2) In the Barzuk Steppes, along the north-west coast of the lake of Aral, on the Caravan road from Orenburg to Khivah	47°	„ ‡
(3) Between Kuwan and Yan Darya, on the caravan road from Orenburg to Bokhara	47° 50′	„ §
(4) On the Kungur tract of sand west of the Sarasu	48°	„ ‖
(5) South of the Chuï, on the road to Tashkend	45°	„
(6) On the Ala-kul Lake, on the road to the Chinese city of Kulja . .	45°	„
(7) On the Noor Saisan . . .	48°	„

A. Meyer seems to doubt whether the Saksaul is found further to the east.

* Sherefeddin, IV. Life of Timur. Is the Saksaul likely to be found in the Kani Zogal?

† It is not probable that the Saksaul crosses the Ural meridian, which is 49° E. of Paris? Compare Pallas' Salsola Abuscula, vol. i. Table G.

‡ Further north very small bushes are found on the Emba.

§ Conradi. See Witsen?

‖ Büsching, VII. p. 26. Rychov says, the Steppes are 100 versts in length and 50 in breadth, and formerly abounded with this shrub.

Forests.

There are no extensive or connected wooded tracts in this part of the world. The valleys of the Steppes, however, between the Ural and Irgiz, contain more trees than the desolate or low salt Steppes between the Ural and Volga, which inhospitable region may be termed the true boundary of that part of Europe.

Properly speaking, the woods take their commencement from above Orenburg, where the Ural river breaks through the meridian range of the southern Steppes, which have an elevation from 700 to 800 feet*.

(1) The first firs are met with on the northern border of this district, on the Upper Sakmara, which determines the southern limit of the coniferous trees. Further north, between Werch Uralsk and Uï, different kinds of firs, among others the larch, are found in the vicinity of foliaceous trees. Salarskoi, on of the Sakmara line, is surrounded by groves of birch, from which the (Daggot,) or birch resin is extracted, an article indispensable in the preparation of Russian leather. South of the Ural, as far as the Aral, the black poplar is so abundant as to form here the principal feature in the woods of the valleys. The poplar is also found much further south.

In regard to other trees, such as those of the family of Cupuliferæ, Betulineæ, Salicineæ, &c., we must wait further information upon the subject. And as they occur in insulated spots, they are not of sufficient importance to need particular notice at present. We shall, therefore, only refer to those points where, besides the more richly wooded district on the Upper Ural, bushes and brushwood are found. The further south these are met with, the more they are developed; whilst, on the other hand, the Saksaul increases in height the more southerly it is found.

* Falk, p. 189.

Thickets then are found :—

(2) On the Ilek, almost throughout the whole route. (Meyendorf, Eversmann.)

(3) At the sources of the Aspuga and Cuseya, rivers between Sungurluk and Oyil. (Witsen, p. 697.)

(4) In the valley of the Sagis.

(5) In the valley of the Emba; and likewise the sorb tree (sorbus), black poplar, willow, beech, aspen (jadavuk?), cheremk (wild cherry tree, padus foliis aunis), shimolast (Rychov, Büsching, VII. p. 11), alder.

(6) In the meadow valley of the Ural, below Orenburg, very thin river-side bushes, consisting of willow, alder, elm, lime, oak, tamarisk.

(7) East of the Ural, as far as the range of lakes which terminates with the small lake of Inderskoye.

(8) On the Ust-Urt, only little low thickets, in small wadis.

(9) But woods of the Saksaul are found north-east of the Caspian as far as the Tumanie Gora, and north-west and south-west of the Aral. The Saksaul does not appear to form extensive forests, but merely small groups or copses. According to Muraviev, however, forests of the Saksaul exist in the basin of Khivah. The wood is an object of trade.

(10) North of the Aral, in the Barzuk Steppes, only very stunted woods. (Map of the Orenburg expedition, 1771; and the map of the Russian Empire, 1823.)

(11) Meyendorf discovered a larger wood, chiefly composed of Saksaul, in the bifurcations of the Kizil-Sir, eastward of the Aral. The old maps (De l'Isle) represent large forests north of Khivah, filled with wild boars, lions, and tigers (?).

(12) Aspen and beech are mentioned on the Kharach Tau.

(13) The lower valley of the Kamishla is richly wooded with poplars. (Büsching, VII. p. 421.)

(14) In the Kungurlu Steppe some other species of bush and wood are noticed along with the Saksaul.

(15) On the Beloï Ilmen, according to Göbel's map of the mouths of the Ural, 1837.

(16) Southward of Kani Zogál. (Witsen, p. 415.)

(17) Near the salt mountain, Iletzkaya, to the southward. (Pallas' drawing of the salt mountain. Journey I., p. 240.)

(18) Muraviev describes larger and thick bushes on the dried-up branches of the Amu, in the Khovar-desert. At Cheen Muhamed (Arthur Conolly). On the Tiyuk-Kara-su (Kolotkin's Atlas). At the source of the Sina, on the Mugalishov river (?). On the Vasilkara. Above the ruins of Urgenj.

What little wood is found among the Steppes, is confined chiefly to the valleys. The summits are almost all bare, as also the marble mountain about the Upper Kamishla. (Büsching, VII. p. 473.) Eversmann considers the Mugojar mountains to be the line of demarcation for vegetation between the Steppes of Kirgiz and those of Bokhara. (Kiptshak.)

NOTE. *A few detached Notices upon Vegetation, in conclusion on this head.*

Rhubarb also thrives in Khivah. Eichwald, p. 475.

Several species of Rheum on all the coasts of the Caspian. Göbel (II. p. 363) remarks that on the north coast of the Caspian, on the left bank of the Volga, rhubarb grows in such abundance, that in high winds clouds of the dead plant are carried up and fill the air. He brings to mind the passage of Amminanus Marcellimus, XXII. 18: "Huic (Caucaso) *Rha* vicinus est amnis in cujus superciliis quædam vegetabilis ejusdem nominis gignitur radix, proficiens ad usus multiplicis medelarum." The name of the root may very likely, as Göbel means, be derived from the Rha (Volga).

Prunus padus, not in Khivah, but further north, a useful tree. (Muss.)

Chinár trees (Plane trees) in Khivah.

Kamues grass? in the Kipchak. Witsen, p. 711.

Yushan grass? Büsching, VII. p. 20. Artemisia alba, according to Pallas. The Kirgiz pitch their winter encampments in the neighbourhood of these wide-spreading plants, which afford much shelter.

Tak trees, hung with rags and held sacred, on the caravan routes from Merv to Bokhara. (Is it the Saksaul?)

Wheat cultivated northwards of Khivah, as far as Khayuk. (Abulghazi.)

Rich Steppes-flora on the Irgiz, on the most inland fluvial basin of the Kirgiz Steppe. (Büsching, VII. p. 426. Rychov.)

Absinthium on the north-east point of the Aral. Worm-wood plants are very generally spoken of. They are occasionally used for edible vegetables.

A rich flora of saline plants is met with on the banks of the salt lake of Inderskoye. Saline efflorescences on the heath, Solonchak (Büsching, VII. p. 426), on the Irgiz.

The Arundo phragmites, on barren tracts of land, according to Falk, II. p. 109, indicates where water may be obtained at no very great depth; and the caravans do in fact select their halting-places according to the appearance of this aquatic plant. (Compare Pallas.)

Our knowledge of the vegetation of the Steppes of Inner Asia is so limited, that every accession of information upon this interesting subject will be very valuable.

It is to be remarked in general, of the zoology of the Steppes of the Crimea, on the banks of the Volga, and throughout the low land of the Caspian, that the Zoography of Pallas (completed in 1811, and first published in 1831,) has been considerably augmented by Eichwald, Steven, Menetries, Rathke, Eversmann, Krynick, and Nordmann.

Among the mammiferous animals in the Steppes, the Rodentia, which exist by gnawing and nibbling the bulbs of the liliaceous plants (arctomys bobac, dipus

jaculus, spalax typhlus, cricetus arenarius, &c.), are the most numerous. Wolves inhabit caverns of the gypsum mountains, the Barsuk, and the sandy districts; the Canis Corsac roams among herds of the antelope Saiga.

Horses* are the most valuable domestic animals in almost all the grassy Steppes of Iran, Turan, and Siberia. Amongst these, the beautiful race of Argamats from Bokhara supply the cavalry of Khivah. Camels† and sheep, frequently of a good breed for their wool, and some of them with fat tails, together with oxen‡ and goats, constitute the wealth of the wandering hordes. The fine wool goats which Amadée Jaubert purchased in the Steppes near Gouriev, and which were transported to Marseilles, by the route of Odessa and Constantinople, on the account of M. Ternaux, were of the Kirgiz breed. They are, however, very different from the shawl goat of Thibet, whose native country is at a distance of 2000 miles, and no etymological arguments can be adduced to demonstrate the descent of the Kirgiz goats from those of Ladak. Fine wool goats are also bred in Bokhara. (Burnes, p. 175.)

The royal tiger (youl bar of the Kirgiz) roams from Cape Comorin to the latitude of Berlin and Hamburgh, —a remarkable fact in the geography of animals. According to Ehrenberg's Researches, the northern Siberian tiger is of the same species with that of Bengal. West

* Distilled mare's-milk produces the intoxicating kumis (chigan), which Ruisbroek was the first to describe. This preparation was unknown to the Greeks, though they mention the cheese of the Scythians, made of mare's-milk. (Alex. von Humboldt's Examen Critique. Vol. II. p. 308.)

† Not only the double but the single-humped camel is bred in the Kirgiz Steppes. This last animal, generally the inhabitant of very hot countries, for example, of Egypt, endures the winter cold of the Steppes, though generally covered with snow in that season. The attempt of Frederic the Great to domesticate the camel in Brandenburg, was justified by this fact, because, though Orenburg is in the same latitude as Berlin, and the northern limit of this valuable beast, the winters there are certainly not so intense as they are in the Kirgiz Steppes.

‡ These only flourish in the reedy districts, as horn cattle cannot seek their food under the snow. Very large cows are bred by the Kara-Kalpaks.

of the Caspian, in the forests of Lenkarah, in lat. 38½° N., the tiger is described by Eichwald as being not inferior in size to those of Bengal; and yet the thermometer in winter at Elizabetopol, situated a little more to the northward in lat. 40°, sinks 7° to 8° of Réaumur below zero. The tiger even roams at times in the neighbourhood of Tiflis, in latitude 41° 40′. MM. Nordmann and Menetries prove, however, that the Caucasus proper is free of this animal. (Faune, Pontique en Voyage de Demidoff, p. 32.) In October and December, 1839, a tiger was killed at Sentovsk, not far from Büsh, north of the Altaï, lat. 52° 18′; and also in Altaï. He is likewise shot in the vicinity of the Aral, near the Sir and the Kuvan, and found even on the banks of the Ob. Spasky observes, in the Siberian Journal, that a tiger was killed near the river Alёa, not far from the manufactories of Loktev.*

Seals inhabit the Caspian and Aral Seas, and the Baïkal, but are not found in the smaller lakes. M. de Nordmann is convinced, that the seal (phoca vitulina) of the Caspian does not differ from that of the Black Sea. (Voyage de Demidoff. Faune, p. 23.) According to Burnes (II. p. 189), the water of the Aral is so little salt that it is, like the water of the Baïkal, drinkable. The lake is very seldom frozen; though the Oxus is, on the contrary, frequently so, even in latitude 38°. (Burnes, II. p. 193.)

* There is a passage in Levshin's work, which says: "Bárhr is a species of tiger of the form of a lynx or cat, with a spotted coat of a light yellowish colour, very sharp face, short neck, and possessing extraordinary power in its claws or fangs. Many of these animals are found among the reeds and bushes on the Aral and the Sir-Darya, and not only attack men, who cross their paths, but particularly horses and camels. They are so strong and fleet, that they not only overtake a horse, but also a camel, and instantly tear them down. They are of no great height, but long, the large ones six feet and upwards. They are caught when young. It is said that they are suckled and fed by the parents for three years, during which time they are so tame that they are taken without danger. The value of a skin of a large sized animal in Orenburg is thirteen roubles, one of a middle size eight, and five for the smallest."

A species of crocodile, three or four feet in length, exists on the eastern shores of the Caspian, which Eichwald was the first to describe, and which would certainly have been mentioned by the ancients, if it had been known to them. It is a monitor, or more likely a psammosaurus, according to Fitzinger's system. (Eichwald, t. i. p. 273.)

Of the chase or hunted animals of the Steppes, besides the furry tribe, we will only mention the wild boar. It is found in great numbers in the vicinity of all the rivers. The mouse of the Irgiz Steppes. Dog-geese, so called from their brooding in earth-holes. The Falco chrysaëtos builds its nest in the Kirgiz Steppes, and may be the bird, Berkut, which is trained for hunting the wolf. (Rychov, Büsching, VII. p. 49.)

Sturgeon and Hausen * fishery is carried on in the Caspian, on the Ural as far as Uchung near Uralsk, and in the Aral.

Finally, as a general observation respecting the phenomena of the Flora and Fauna of this poor and barren region, it may be said, like the whole of Turan, to mark very distinctly the transition from the natural productions of Iran or Persia proper, to those of Ural district of Siberia. The productions peculiar to the country are comparatively but few in number and of little consequence.

Numerous tribes of two Turkish nations† have wandered over the barren Steppes east of the Ural and the Caspian Sea for many centuries past.

(1) The lesser Kirgiz horde of freebooters, who have not so much Mongol blood as the other two hordes.

* Hausen is a species of sturgeon.

† According to Klaproth, who argues that Tartars and Mongols are identical, and that the Turks have been erroneously called Tartars. (See Polyglotta, p. 217, 231.) Pallas's Journey in different provinces of Southern Russia—(Witsen.) Rychov expresses a right opinion upon the propriety of the appellations, Scythian and Turko-Tartars. He maintains that in the whole of Western Asia the name of Tartar belongs to no nation. (Büsching, vii. p. 89.)

(2) The Turkomans,* with even much less of blood than the other races, which wander over t grass mountains of Iran.

Such an unmixed population can only exist length of time amidst wastes and deserts.

(3) The Oasis of Khivah,† therefore, contains a tion of freemen, and slaves, composed of people f surrounding countries,‡ and of those wanderers merchants or slaves, are spread over the extensive These are Armenians, Indians, Nogaians, Sarts, bians (2000 according to Falk), Oïghurians, Gipsies, Negroes.

The Uzbeks, of Turkish origin, which sub nearly all Turan, govern this mixed people, a whom the Tajiks,‖ Sarts, are not sufficiently num to make their language (a dialect of the Persian) dominate as it does in Bokhara. The Khivah lang is in fact a dialect of the Turkish.

The people of Khivah profess the Sunnite doct which tends to widen the line of separation betw them and the Persians.

(4) Since the destruction of the fortress of Konra the people of the Aral wander among the many rami tions of the delta of the Amu to the south of the A Sea, in summer and winter. They are composed of r aways belonging to all the surrounding races, and p

* Klaproth's and Burnes' specification of words do not differ materi Eichwald and others make the remark, that the dialect of the Turkomans on shores resembles very closely to Nogaian in the delta of the Volga.

† The territory of Khivah is drawn after a rough sketch of General Gens Helmersen's Report, 1839. The situation of places in respect to each other, very different on the sketch, when compared with former drawings. (Map of t Empire, Muraviev, &c.) How differently are the two Urgenj, Khanka, Kat, place

‡ Rychov, Falk, Muraviev, &c.

§ It would appear that these also have been pushed back from the Volga a Ural. They wandered from Sarachik towards Khivah.

‖ Arabs.

¶ See Ritter's Geography, II. 1808, of the History of the Upper Khánáts.

artís, according to Muraviev		100,000 souls	Employed in the towns as artisans traders, and in the villages as agr culturists.
Kájiks	. . .	2,000 families	
Jews	. . .	200 souls	
Persians	according to Gens	30,000 „	
Russians	. . .	3,000 prisoners.	
Afgháns	. . .	15 families.	
Arabians, according to Falk, III. p. 529		2,000 „	

Uighurs are mentioned besides (5).

Fraser heard of Noghaians in Khivah; but Gens, Muraviev, Schneegass, and Fal mention Bucharians, Armenians, Kirgiz, Kalmuks, Kurds (7), Kabuls, Moltans, and others I dians, Aïmaks, Káyansárs, Negroes. Khivah is, therefore, a rich field for the investigation languages.

(2.) Igdur is a branch of the Chobdur Esenli tribe, according to Muraviev.

(3.) The offsets of the principal tribes are here given very minutely.

(4.) Strahlenberg places the black Turkomans here.

(5.) Witsen mentions (p. 776) the Uighúrs as being the followers of Attila, but does not refer any ancient work.—Abulghazi says positively, they used the Tangut-mark. Gens calls them, a tribe Uzbeks. Witsen, p. 776, says, Jugorie or Jungeni (compare 615). Witsen, p. 478, says, fr Abulph. Gozl. Elmacin, that Khawrezm lies in the neighbourhood of the Uighur, towards the no contiguous to the country of the Turks—p. 429; and, upon the authority, probably, of Ahn Arabsía, that Turkistan and the Geteh adjoin Khwárezm, towards the east.—See Ahmedis Ar siadæ Vitae et rerumgestarum Timuri, qui vulgo Tamerlanes dicitur, historia latine vertit et annotatic adjecit S. H. Manger. Leowardiae, 1767, p. 481, perhaps, according to Hamdayla: the Khwarez language is different from that spoken in Khorasan.

(6.) Muraviev, Voyage revu par J. Klaproth: Paris, 1823, p. 263. La population soumise im diatement au Khan de Khiwa parait s'élever à plus de 300,000 âmes. Muraviev's Journey, tra lated by Strahlenberg, 1824, ii. p. 30.—The Turkoman tribes are, perhaps, herein included? (366, families, according to Muraviev.)

(7.) Probably wanderers from the Kurd colony founded in Khorasan, under 'Abbás II.

bably also of a remnant of the fishermen, originally the inhabitants of those coasts.

As in Afghánistán and in other hilly districts, it is not uncommon for different tribes to settle in each other's vicinity, without losing their separate distinctions; in the same manner also the inhabitants of sea-coasts, as well as those of the islands of a delta, have collected together from the surrounding districts, without entirely obliterating the Autochthons or original inhabitants of such localities (*e. g.* Egypt).

(5) East of the Aral, a branch of the lower Karakalpaks found shelter in the delta of the Sir, after this Turkish tribe was pressed back from the Volga. Similar traditions say, that the Kirgiz were driven back from the Euphrates, to the Mongols on the Yeniseï.*

Russia, Persia, and Khivah† exercise a very doubtful influence over these intractable Nomades. The protection of Russia is acknowledged as far as the Emba and the Sir. South of these rivers, commences the ascendancy of Khivah. The Turkomans of Mangishlak also acknowledge the supremacy of the Khan of Khivah for the sake of trade; whilst those only in the Gurgan delta and the mountains of Khorasan are subject to Persia. This range of heights, remarkably open on the Tedjen, forms the present boundary of Iran and Turan. Herat lies on this its weak side.

The wars of the Khivans, as of all independent Nomades, are avowedly plundering parties.

The accompanying table gives a sketch of the geographical divisions, and the numbers of the tribes. The Turkoman tables are compiled from Klaproth's Asia Polyglotta, Arthur Conolly's and Muraviev's Journeys.

* Pallas. The Turkomans also of the Salir tribe, maintain that these conquered Constantinople.

† Compare Björnstierna and a Treatise in the Haude-and-Spener's Gazette, 8th Feb. 1840.

The decay of the caravan trade, from the countries about the Oxus to North Europe, requires a few remarks. Ruisbroek, Marco Polo, Balducci Pegoletti (1337*), and many others, travelled with safety through the Kirgiz Steppes, the Turkoman isthmus, and the Kipchak deserts. The latter travelled in carriages drawn by camels.† Rychov speaks also of a journey of four days, in a carriage, from Gouriev to Mangishlak. Here are, therefore, wheel vehicles—Arabahs—employed (Ritter); but in the more mountainous countries further east, scarcely any mention is made of them.

Urgenj, Otrar, Saraïchik, are large places of trade. Jenkinson, however, in the year 1558, incurred great dangers in travelling with a caravan from Manguslav to Bokhara. These dangers from later accounts appear to have been exaggerated.

Finally, almost the only means we now have of gaining information respecting these countries, are through the medium of returning prisoners and political missions. The cause of such interruptions to a commerce, now nearly extinct, can be attributed only to the growing power of the uncivilized Uzbeks, because Timur, Ulugh Begh, and Baber, always protected trade in peaceable times.

The discovery of other more profitable routes from India to Europe,‡ would naturally have destroyed the commercial importance which Khivah possessed at the time of the Arabians, and which is proved by the discovery of the Arabian silver coins in the countries of the Eastern Lakes, and from other accounts.

The open country on the north shore of the Caspian, though not so remarkable for narrow defiles as those of

* Sprengle's History of the Discoveries.

† Eichwald pretends to have discovered traces of carriages upon an island in the Caspian.

‡ Witsen, p. 712. Indian Banyans carry on most of the trade to Astrakhan.

Derbend, Colchis, Attok, on the mouths of the Danube between the Hungarian highlands and the Black Sea, &c., was, however, of great importance, not only as regarded the wandering habits of the people, but also for the transit of trade in the middle ages, and particularly so as the extraordinary vicinity of the Volga and the Don afforded convenient water-carriage to the inland seas of the north of Europe, and to the Mediterranean, on whose shore the inhabitants in those ages held the trade of the world in their hands.

Numerous caravan stations and commercial factories were established, for the protection of trade in this country.

We give the following accounts of ruins, the remarkable localities of which are also mentioned. A great number of these certainly belong to this early period of a flourishing trade. No other stone buildings are found except these remains, neither is there an instance scarcely of any spot resembling an European village from the Yaik to Khivah.

Sarachik in the delta of the Ural: (Ritter's Geography, II. 1818, describes this commercial depôt as being probably the most advanced station of the Seres.) Compare Pallas. Göbel calls them Tatar ruins, though they are now scarcely to be seen.

Smile on the Ural (where?) Witsen, p. 306.

Intrenchments on the middle Ural at the mouth of the Kindeley. (Pallas.)

A white stone dam in the Sagis.

Khazik-tash on the Sagis. (Pallas.)

Beikanchin on the Emba. Schneegass mentions some extensive ruins at a ford of the Emba.

Tangutian ruins on the border of the Caspian. (Falk, p. 894): "Prince Bekevich saw several ruins there, consisting of doors, steps, and figures of idols. He found also rolls of Tangutian manuscripts."

At Bilyuli-Ata, Thor, and Mesh-hed. It has been said that the banks of the Caspian reached these places, from whence both the Caspian and the Aral can now be seen at the same time* (?).

Shom: ruins of a Nogaian town on the route from Orenburg to Khivah. (Falk.)

The ruins of three citadels are found on the Shin (Chink?) mountain north of Kuptam.

Aïrakli, Chergali, Emli, Jol, Bazarli, and many others, are Turkoman villages, built upon the foundations of ruined towns. (Falk, III. p. 524.)

According to Schneegass, Olank, on the road from Khivah to Mangishlak (Muraviev), and Blenauli, are stations on the Ust-Urt. Small and deep lakes are found in the neighbourhood.

Burnes, as well as many others before him, mention Barsa Kilmez.

Iskender castle and Bezbarmagán (founded by Alexander?), according to Muraviev and Witsen.

In the Steppe of the lesser Kirgiz horde, near Baitak, on the Kobda, the Or, the Ati-Uyil, Ilek, Sagis, on the Sir, there are many ruins, ancient tombs (tumuli), and old mines.

Ján-kand on the Sir, and other places. "In the tract of country, Bakchi, two days' journey upwards as far as the source of the little river Sina, which flows from the mouth of the river Mugojar, and at this mouth, where is also a forest, there are old ruined towns, choked-up canals, and tombs; also many hillocks thrown up, out of which human bones of extraordinary size (?), gold and silver, and all sorts of arms and utensils, have been dug." (Rychov.)

Remains of the hill, on which the Tatar Khans near the Emba were elected.

* Rychov, Büsching, VII. p. 85. What period is meant?

Extensive ruins at Tuk-Karaghan and Mangishlak. (Eichwald, Müller, VII. p. 169.)

The ruins of castles are found also on the branch of the Amu, which is choked up with sand.

The ruins of Khan Urgenj are covered with woods composed of the Saksaul. (Anabasis.)

Bikhet, Silverhill, Krasnoyavoda, are ruins on the Caspian Sea.

In the country of the Frumentoris there are three havens. (Witsen, p. 207. Rychov, in Büsching, VII. p. 95.)

Remarks.—Cultivation has altogether ceased in many places, where remains of canals and gardens are partially found. At Baitak, on the Uyil. At Bakchi, one day's journey from the Emba. At the sources of the Sina, on the Mugojar, at present a wood. On the Irgiz and Turgaï (Nogaians lived there, according to Rychov). At Bilyuli-Ata. At Sellizur. About the choked-up branch of the Amu, on some points of the Caspian shores. North of Bokhara, near Cara-ata, according to Eversmann. The mouth of the Sir. At Khayuk, Tuk, Arab-verhnja. Around the borders of the desert, namely, at Zam, Farab, Baikand, at Khodchoban. In the valleys of Khorasan, Abiwerd, Nisa, Deregez. Preeslanees, probably Pristanisa. At Balkh. At Maimunah, and several other places. Traces of former husbandry have generally been found among the above-mentioned ruins. We have, however, not so much proof as to warrant the belief that agriculture was carried to any great extent. It has probably lost more in intensity than in extent.

Exertions have been made, during the last two centuries, to restore the trade with central Asia, which have been crowned with great success on the west side of the Caspian Sea, and on the Chinese frontiers. Numerous trading journeys from Semiplatinsk to Ak-su, Kashghar Yarkand, Khotan, Leh, and Lassa, are undertaken. Attempts have been made, also, to provide places of refuge for this purpose on the east coast of the great inland sea.

The ruins of the forts, which Bekevich established at Mangishlak (which once boasted of 700 houses), on the bay of Alexander, those at Karagan, on the choked-up sandy haven of Mangishlak, are proofs of these attempts.

It is worthy of remark, that Russia made the first steps towards this object by means of Englishmen: Hanway, Elton, Jenkinson, Bruce, Thompson, Hogg, and others; and then followed the Russians themselves, Dubrovin, Kyrillov, Soïmonov, Koyin, Tokmachev, Bekevich, Kolotkin, Muraviev, Muravin, Bassargin, Burnashev, Nazarev, Levshin, Berg, Karelin.—Meyendorf, Eversmann, Eichwald, and other Germans, have a share also in the great work.

The islands off the Tuk Karaghan,—Kulati, Sviátoï, are taken possession of.

In the last years an excellent spot in the Tiyuk Kara-su has been selected for a harbour, of which there are few to be found on the Caspian, namely, at Novo Alexandrovsk, a fortified commercial depôt. In the summer of 1839, intrenchments were formed at Ati-Yakshi and Ak-Bulak, in the territory of the Emba, in consequence of which, as is mentioned above, various surveys have been made of the frontier.* Russian and English rivalry has produced the happiest results in the advancement of a knowledge of these countries. Should

* A communication from the entrenched position on the Emba, which the Russian expedition had taken, up to the 5th of January, 1840, fixes this point astronomically. It is drawn on the map. The course of the Emba runs close in its neighbourhood, but this course is indicated according to Meyendorf's and Levshin's road-distances, as they are laid down on their maps. The situation of the intrenchment is in 57° 41′ 45″ east of Greenwich—therefore 55° 21′ 45″ east of Paris; and 48° 19′ 23″ north latitude, or, as my informer writes, about 3½° south, and 2½° east of Orenburg. Ak-Bulak is near the hill of Ak-Butak (200 miles? from the Ust-Urt), and is drawn according to Levshin's map. As his distance amounts to 100 such miles from Ati-Yakshi, which is reckoned to be 280 from Orenburg, it is still very probable that this position is right.

A general map of the theatre of war in one sheet, has appeared in Petersburg,

the present expedition succeed (and there is little doubt to the contrary) against the state, which, from its possession of the most favourable middle station for the route of caravans, has the power to intercept the trade of the countries bordering on the Oxus, new depôts will soon be established for the protection of a more active commerce. From such points of security, it will be possible to set on foot expeditions of discovery throughout the whole of this important thoroughfare. Science is always enriched, when states seek and profit by fresh channels opened to them for their activity.

I.—Letter of Dr. Lessing.

I am happy to give you an extract of the passages in Dr. Lessing's letter, which you wished to have. The following is what I had required of him:—1. To determine the northern limit of the Saksaul. 2. To determine whether the reed bushes (or small reed thickets) of that country, which the Russians call Kamûishi, consist of the Arundo phragmites (phragmites communis), *i. e.* of several species of our reeds, or of any other.

His letter is dated April 5th, 1833, from Gouriev, and gives the following information:

"Saksaul is the Anabasis ammodendron (Meyer in Ledebour's Flora Altaica). It is not a tamarix, as has been supposed. Falk indeed takes the twigs injured by insects for cones, and calls the whole plant a fir. I know from tolerably good source, that the northern limit of the Saksaul is the Tumanie-Gori, on the north-

having the line of the intended march marked upon it. This Russian map has not yet reached us. The above astronomical position is an earnest of further valuable accessions to geography; a proof of the activity and intelligence of the officers of the expedition. According to the latest intelligence, a Russian force (the numbers of which are not given) has landed at Asterabad.

east coast of the Caspian, under the same meridian. (Perhaps its westernmost boundary, also?)

"As far as regards the Kamuish, I can assure you that at this outlet—the Ural into the Caspian—there is nothing but *phragmites*. But whether it be the phragmites communis Trinius (though it probably is) I cannot with certainty decide, until it has put forth fresh twigs. To decide the question, this plant should be most carefully compared with the same species in Europe!

"In my Journey (I. p. 495), I have collected some observations relating to the size of its stem, where it grows on the more southern lakes (and on the Chuï), and have added some remarks on the reed or schilf of of Tibet. In these countries, this plant must possess a very different habitus from ours, because the inhabitants not only construct bridges with this wood, but also make lances of it, with which they spear the deer. The European arundo could not be turned to such purposes.

"A. ERMAN."

II.

The following Information from Petersburg, comes from an eye witness well acquainted with the countries represented on my map:

"Major Karelin, who constructed the fortified commercial depôt of Novo Alexandrovsk, on the east side of the arm of the Caspian, in the Tiyuk Kara-su, which penetrates deep into the Turkoman land, remarks that there are many islands in the Aral, towards the mouth of the Amu-Darya, or Sihon (Oxus), and no others, and certainly not those mentioned by Levshin; whilst, on the contrary, the stream of the Sir-Darya at times carries away portions of the land, which float about this inland sea, to all appearance resembling swimming islands of reeds."

The northern banks of the sea are much wooded with Saksaul, but which is never above nine feet high, and which furnishes the well known horny brittle wood, which is used in the Steppes as fuel, and is not hewn but broken. The borderers on the Aral occasionally navigate the sea upon rafts, provided with wash-boards, made of the thin stem of the black poplar (Ossokor in Russian). The notion that "the discharge of the Oxus into the Caspian has been dammed up," is not confirmed by Karelin. He is also of opinion, that it was only a subsidiary channel, which has been dried up by the continually increasing depression of the surface of the Aral. This notion of an embankment has originated from the practice of the inhabitants of the Delta of the Oxus, who dam up the waters for the purposes of irrigation. The river Ural has only one foot of water on its bar near Oberwind; and the mouth of the Emba is entirely lost in sand and muddy lagoons full of reeds.

III. Some Observations on Western Central Asia.

The following Memoir, which has been communicated to me by A. von Humboldt, is ascribed to the Graf von Cancrin.

The present geographical and topographical divisions of Western Central Asia, namely, *Má-war-álnahr* and *Khwárezm*, now bearing the names of *Bokhárá* and *Khívah*, suggest a few observations on the remarkable changes to which the surface of the earth has been exposed in the course of time.

According to the Greek and Asiatic historians, these countries were formerly in a much more flourishing condition than what the modern Russian accounts represent them to be in at present. Bokhara and

Khivah are, indeed, still two respectable oases, or groups of oases, in the midst of a sea of sand, in which are to be found considerable remains of political and physical cultivation; not, however, to be compared with the former state of these countries. The causes of this change are of various kinds.

Amongst the first of these causes we may reckon the gradual desiccation (often referred to by others), if not of the surface of the earth generally, yet certainly of many countries which are not drenched by tropical rains, nor by the winters of higher latitudes. If we look at the map of Central Asia, we recognise as having existed in the ante-historical time an immense sea, which being in many places probably only a shallow swamp, full of reeds, united the Black and the Caspian Seas; and which, as it gradually dried up, left the Sea of Aral a lake. It is extended northerly to the left far into Southern Russia; to the right it watered the foot of the Siberian mountains, and reached eastward as far as the mountain ranges which extend from Kultha to Ust-kamenogorsk, along the Siberian frontier; where the great Steppe-Lake Balkhash or Tenis, remained in a deep hollow. To the south, the great lake we are describing was bounded by the hills of Turkestan, and those which divide Bokhara from the desert, where the remarkable Steppe-Lake of Telekul presents another relic of its waters. Many ranges of hills and plateaux must have risen above the waters as islands, particularly the high land of the Turkomans west of the Aral. The lower course of several of the large rivers, which now flow into these lakes, was then covered by them. Many rivers of these Steppes, which are now lost in sand, in lakes, or in rushy morasses, came first into existence in the process of the desiccation above alluded to; and to this is to be attributed the peculiar nature of some of

them, which Ritter designates as coral rivers, or a number of small lakes connected together by a Rinnsaal or water-course. Other rivers, with a fuller stream, from having no fall, could not find their way to the sea, and were lost by evaporation. Salt-steppes, as well as salt and bitter lakes, were the result, wherever the bowl or crater-formed shape of the country, or the absence of snow and rain, presented no means of sweetening or freshening the surface. Enormous tracts of sand, or a dry clay soil, characterize the greatest portion of the former bottom of the lakes; many salt and bitter springs, some too which are sweet; water also always to be found in the hollows, though rarely attainable in the higher situations, are other properties of this once watery expanse.

This extraordinary change of the surface may be attributed in part to the out-break of the Black Sea, and in part to the phenomenon above mentioned, and generally allowed, of a gradual desiccation of the earth in those parallels where there is little or no rain.

Such gradual desiccation does not seem to be a matter of doubt, even in reference to the historical period of this part of the earth; in more recent times indeed, at least according to the assertions of eye-witnesses with respect to the Lake Aral, it has been going on gradually increasing.

We may thus account for the progressive increase of the sandy Steppes as in Africa, the desiccation of many of the rivers, the diminished mass of water in others, and generally the greater aridity of the district. The oases, which owe all their verdure to irrigation, are consequently reduced in extent, and the inhospitable intervals become greater. Around the rivers, and in the neighbourhood of the Aral, we find every where under the sand, often at very moderate depths, an extensive

supply of water, which at certain depths issues in springs, and which at times, if suitable trenches or canals are excavated, is said to form even flowing streams; but this natural consequence of the waters of the district being carried off only by evaporation, is merely local; and, without doubt, the abundance in springs and sources is in other places very much diminished. Were it not for the snow of the different ranges of high mountains, particularly those of Turkestan, the large perennial rivers would still have been much less abundant than they usually are. But to return to our purpose.

Other causes of the decline of this region, intimately connected with one another, are the change in the route of trade with India, the destructive ravages of Ghengis Khan and Timur, the change of races, and Mahometanism.

Scarcely had these countries recovered in part from the murderous and destroying campaigns of the Moguls, when they were visited by the ravages of Timur. Much, however, might probably have returned to its previous state, if other causes, besides the progressive desiccation of the water, had not contributed to the further decline of this tract. The former industrious people of various races, as the Aramaic, Old Persian, Indian, Chinese, or others less known, were gradually expelled or subdued by new hordes of Turko-Mongolian origin, less advanced in policy as well as in industry: and this has had a very great influence on the entire ruin and fallen state of Asia. Mahometanism, which was of a nobler aspect as long as the Arabs exerted an active sovereignty, assumed at a later period a decidedly destructive tendency. It completed the work of devastation by a spirit of morbid insensibility; it gave additional force to the inclination to fatalism and indifference; and it created that principle of destruction which presides

over all the modern governments of Asia. If the expansive power of the mind were not so strongly expressed in all human beings, Asia would long ago have been still more of a desert than it really is.

The chief cause of the degenerate and barbarous state of Central Asia, was the change which took place in the Indian trade, part of which took the direction of different Trans-Uralian points in Siberia, another part that of Saraïchik, and Astrakhan, and partly that of Mangishlak; and which in earlier times had ranged between the Gulf of Balkan and Kuristan (Grusien, Georgia), on the Pontus. In process of time, the chief part of the traffic was transferred to more convenient western routes; and, with the circumnavigation of the Cape of Good Hope, the whole of the Indian trade, for the great mass of the civilized world, was carried on by sea. It was only with the adjoining continental districts that the overland trade continued to be a collateral branch of minor importance. At a later period, since European industry has got the better of the manufactures of the East Indies, the trade of India has become of still less consequence, and is now confined to raw materials, or wares difficult to be conveyed, such as spices, dyes, cotton, silk, &c. The remaining articles, which are of easy conveyance, are indeed in part of high value, as shawls, but they are not sufficient to lay the foundation of a very important land traffic.

Hence it seems to be an illusion of long date to expect any extraordinary or exclusive advantages for Russia from the over-land trade with India; particularly as the returns would be still more difficult than the imports; and the trade itself, should it ever be established, must be circuitous, and will turn out little more than barter. This is, however, no reason at all why our trade with Central Asia, and its southern neighbours, may not receive

a very considerable extension; only we must not entertain any visionary schemes respecting it.

But to return. It was to the route of the trade with India, particularly in more recent times, across the Old Urgenj to Saraichik and Astrakhan, or Mangishlak, that those places were indebted for their prosperity as entrepôts. As memorials of this period, the observer is struck with the remains of buildings, towers, caravanseries, and wells surrounded by walls, which we meet with in the dreary and elevated deserts of the Turkomans, between the Aral and the Caspian. A lucrative commerce then readily repaid the exertions by which these stations were established; the nomades of the Steppes were likewise less barbarous, or they enjoyed a more perfect independence, or they suspended their practice of pillage and robbery, to make larger gains by furnishing the means of commercial transport. Similar remains of buildings in other directions were mainly owing to a like origin.

Among the interesting historical questions respecting this country, is that relating to the former course of the Oxus, Sihon, or Amu-Darya, and its embouchure into the Caspian, which is said to have been purposely dammed up.

The descriptions of the ancients point to some very remarkable changes in this district. They speak of the Ochus and Oxus, which were united, and then separated —both of them falling into the Caspian; of rocky cliffs and waterfalls, where are now sandy tracts, &c. The eastern banks of the Caspian have certainly suffered great changes; and partly on this account, and partly from other causes, are the maps of this district so little to be depended upon. Who then, can decide on the errors and ignorance of the ancients in these distant countries, or to what extent they changed the names? whether we possess their writings in a pure state, and how far we understand them, or what have been the real

changes effected by nature? There can be no doubt that the last has taken place on a large scale; but we may still be allowed to consider many of the notions of the ancients as hypothetical.

Without attempting an extensive and learned inquiry into this object, which would here be out of place, we shall lay before the public the following concise review of the later travellers.*

The earlier accounts of the *Sihon* are confirmed by the travels of Muraviev, in 1819, the maritime survey of the naval officer Bassargin, in 1826, preceded as it was by that of Ladishinsky, in 1825, according to the narrative of Professor Eichthal (Eichwald?). The Gulf of Balkan receives a river, which is lost in a swampy marsh (Bassargin). According to Eichthal (Eichwald) the river is nearly twenty feet deep, and must therefore have been a different one from that of Bassargin; or the Ilmen of this last named traveller was itself, during an east wind and low water, a part of the Gulf of Balkan, and he never reached the real river. Muraviev, according to information given to him, indicates a double embouchure of the ancient Sihon, one in the Gulf of Balkan, the other much further to the south, near to the Naphta Island. This is confirmed by Eichwald. Muraviev, on his journey from the Gulf of Balkan to Khivah, frequently meets with the dry channel of a river, which was formerly of great breadth, and which trends towards that gulf. (Rubies and turquoises, and gold sand, are said to have been found in former times on the banks of this stream.) The ranges of highlands, and especially a kind of steep sea-beach, with hollows, discovered between the Aral and the Caspian, prove that the Sihon must have emptied itself either into the Gulf of Kara-

* Burnes denies altogether the ancient outlet of the Oxus into the Caspian (?), t. ii. p. 188. What a loss to science that he did not visit Khivah!

Bughaz (which, according to Muraviev, lies in front of the salt lake Aji-Kuyuk, though this is matter of doubt with others,) or into the Gulf of Balkan. If the maps are not wrong, the distance is in favour of the former supposition. Muraviev shows that all the earlier maps are exceedingly inaccurate, even those of the best known parts of Central Asia, as well in respect of the mountains, as the rivers and gulfs of the whole district. The possibility of there ever having been a river called Ochus, besides the Oxus, is indeed, by those maps, rendered extremely doubtful, as the Gulf of Balkan and the supposed double embouchure of the Amu approach to within a very short distance of the limitrophe rivers of Persia, namely, the *Atrek*, and the *Gurgí*, with the boundary wall of Kizil-Alan. But the southernmost of these two mouths, which is out of the limits of the Gulf, has not yet been examined; and it is just possible that the Ochus and the Oxus may terminate in these two mouths. This is indeed rendered rather doubtful,* by the fact, that the *Sambar*, an affluent of the *Atrek*, seems to intersect the supposed basin of the Ochus, if we suppose this latter to be flowing parallel to the Oxus. But the *Tejen* has been taken for the Oxus; traces of this river are given by Muraviev in the desert, but as if running towards the dry bed of the Oxus or Sihon. The ruins of *Old-Urgenj* are indubitable, as well as the swampy bed of the river near this extinct city. But the course of this channel of the Sihon has not yet been followed throughout. It is, therefore, not yet ascertained, whether the remains of the bed of a river, which have been found in various places, belong to the same stream; nor what part the Tejen can claim in these appearances; whether it ever really flowed into the dried up

* This doubt is raised in A. Conolly's route. The dry Nullah (bed) filled with boulders at Chín Mahomed must be examined by future travellers.

branch of the Sihon, or whether one of the mouths, of which we are speaking, as was the old opinion, belongs to the Tejen itself; whether also the stream of the Urgenj was not an affluent of the Aji-Kuyuk, of which we know nothing certain, especially as Urgenj is so much to the north of these embouchures, which thus took an unusual and retrograde direction towards the south. All this must be cleared up by further journeys and researches.

It is, moreover, a fact, that nine hundred years ago, *Ebn Haukal* knew of no outlet of the Amu into the Caspian, as well as that the Cossack freebooter, Stenko Razin, was never in this country; consequently the alarm, which, as the story tells, preceded him, cannot have been the occasion of damming up that river. Such a measure, indeed, in a country which so entirely depended on irrigation, would have been of such an heroic character, that it requires strong confirmation to make it credible. On the other hand, the Baron Meyendorf assures us, that he was told of a dam or embankment, which is from time to time undergoing repairs, and on which many labourers are still occasionally employed.

Moreover, the possibility of the damming up of a principal stream in a country of sand, is very problematical. It seems also contrary to all analogy, that the Amu, being already so near the Aral, should make a divergence towards the Caspian. Finally, if this river had really been dammed up, the subsidence of the Aral would seem improbable. For a river, which had required, and could have furnished, a divergence of this kind, must, if it had been dammed up, have greatly contributed to raise the level of the Aral; but if the absorption of the water in the lake and in the sand had been sufficient, after the loss of the diverging stream, to dispose of the water

altogether, without raising the surface of the lake, such a divergent could not have existed even in anterior ages, for this possibility of absorption evidently existed at all times, and it was the readiest means to put an end to the river.

Another mode of explaining this phenomenon, occurs to us from the gradual desiccation of the country. When in very remote times the Aral stood at a much higher level, it formed only an inland lake of the Amu river: the branch of this river, which is now dried up, was properly the outflow of the lake, and covered the spot where, at a later period, the bifluence or double stream began. This outflow could only break through where traces of it are still remaining, as all the land to the north lies too high. But when, by gradual desiccation, the level of the Aral was lowered, and the affluents of the Amu were reduced, the bifluence or double stream naturally became apparent. As the Aral became more shallow, and its surface sank, the mass of water no longer required this outflow into the sea (Caspian). This branch then gradually dried up; the evaporation was sufficient to exhaust its waters, though at times there would be sufficient water to fill its bed. Perhaps this change was aided by earthquakes; but these could not be the only causes, for when the mass of water was sufficient, the river somewhere or other had again burst or worn its way out. When the old outlet had become very shallow, it was no longer sufficient for the purpose of irrigation. This dearth of the necessaries of nature—no imaginary alarm—brought with it a change of residence, and Old-Urgenj was abandoned. A dam or embankment may then have been carried into the shallow water—perhaps during the period of the swelling of the river—with a view to economize the precious element for the other canals; particu-

hrly as, in all probability, a gradual absorption was here also experienced. The Asiatics are very intelligent in everything that relates to irrigation.

The problem thus admits of a natural solution, and the brilliant idea of re-opening the old course of the Sihon, and of carrying a navigation as far as Balkh, &c. &c., not unmentioned by the ancients, is, alas! impracticable, apart from all political considerations; and not less so, even if the project of damming up the branch which flows into the Aral could be carried into effect. For the diminished quantity of water would either find for itself a shorter passage under the sand to the Aral Lake, or there would not be sufficient force in the stream to reach the Caspian, and it would be gradually dried up. We need not make mention of the pestilential vapours, which would be produced by the sudden diminution of the flow of water into the Aral.

Another flattering notion has been entertained, independent of this renewed discharge of the waters, namely, to navigate the Aral and Amu with steam-boats, to be built on the Aral itself. But, even if it were ascertained that the lower course of the Amu had sufficient depth, the construction of such steam-boats would be subject to insurmountable obstacles, and would be of very little use even if successful, as steam-boats on rapid rivers can only carry very small cargoes; and from the experiments made upon the Volga, it seems that the towing-up heavily laden vessels would be attended with no good result.

We must, therefore, in all probability, remain contented with the living ship of the desert, the camel; and the experience of thousands of years teaches us that this engine of transport is sufficient for carrying on a very considerable though limited trade.

The principal obstacles, at present existing, to the more rapid extension of the commerce of the western portion of Central Asia are, the general aridity of the soil, the danger to be encountered in the Turkoman and Kirgiz Deserts, and the plundering disposition of the government of Khivah. These circumstances, and the difficulties which European Christians experience under Mahometan rule, render it adviseable to leave this trade principally in the hands of the Asiatics, which will itself be a hinderance to its increase. To this we may add, the declining state of civilization generally in Central Asia, the difficulties of transport for the more weighty goods, and other objections.

The following may be considered as the principal routes for the trade of the western parts of Central Asia at the present moment:

1. East of the Sea of Aral, through the Kirgiz Steppe from Orenburg, Troitzk, and other places to Bokhara or to Khivah.

2. Through the Turkoman Desert—(*a*) from Khivah by Sarakhik to Astrakhan, or direct to the Emba—(*b*) to Mangishlak—(*c*) to the Bight of Balkan.

The roads through the Kirgiz Steppes are better supplied with water and pasture; but they are exposed to the attacks of the Kirgiz tribes, and to the more dangerous hostilities of those of Khivah. Few or no ruins are to be met with on this route; a proof that this is a modern road.

Those which lead through the elevated Steppes of the Turkomans towards Astrakhan, are ill supplied with fodder for cattle, and, though by no means safe, they are more so than the Kirgiz Steppe. The shore of Mangishlak is an inconvenient station for unloading goods, on account of the plundering habits of the inha-

bitants; but there is good anchorage even for ships at Tuk-Karaghan. None but Russian fishermen come to the Emba, and these are frequently exposed to attacks.

The road to the Gulf of Balkan is, in respect to any trade of importance, almost entirely abandoned, though it is the shortest road to the Kur river, and there is good anchorage at Krasnovodski. Abundance of drinkable water may be procured by digging wells.

Generally it may be said, that in these western districts commerce can be successfully carried on only through the means of Khivah, whilst the mode of government of this place, and its long-continued hostility with Bokhara, still oppose great obstacles to the extension of such trade to the more remote districts. These obstacles might, however, be gradually overcome by a profitable commerce, if means could be adopted to conduct it upon improved principles.

Here we close this memoir, not wishing to indulge in more extended discussions.

IV.—Letter from Dr. Lessing.

Orenburg, April 3, 1833, N. S.

The journey which I made in the middle of last summer, to the Steppe of the smaller horde, has given rise to the following observations; which, partly in consequence of my want of time, and partly because my materials are not yet put in order, can only be considered as the skeleton of what I have done, or as the preliminary sketch of the country.

The whole Caspian Steppe, distinguished by its level *below* that of the great ocean, seems to me to be bounded

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by the following districts. Its northern boundary is formed by the Ural, and the western ramifications of the Obchei-Syrt. To the east is the Altaï range. Its southern and south-western boundaries are yet unknown to me; but those to the south-west are the high southern shore of the Caspian Sea, and the advanced range of the Caucasus; whilst to the west it may be said to extend nearly to the Black Sea. The Steppe, which lies on the left bank of the Ural, which is more especially inhabited by the little Kirgiz horde, is divided into two extensive natural districts by the southern prolongation of the Ural range. The river Ural, in forcing its way through the mountain, in which it takes its rise, does not form any valley, properly so called, but only a very narrow ravine. The hills, known by the name of *Guberlinsk*, are nothing more than the broken off, or detached south side of a plateau, but which is invisible to those who travel on the line of the post road. If a traveller follows, for about twelve versts in a northerly direction and against the stream, the Chebekla, flowing in a deep valley, and emptying itself, together with the Guberla, in the Ural, and then, leaving the river on the left, mounts a height of from three to four hundred feet, he comes at once upon a plateau perfectly flat and without a tree, whence not a single hill is visible in the neighbourhood. A similar plateau-formation occurs, only not so extensive, after following the Terekla against the stream about twenty versts; the Terekla falls into the Ural on its left bank. We might, therefore, with equal propriety, call the Guberlinsk Hills, the Guberlinsk Valleys.

The Guberlinsk Hills are as much a southern prolongation of the Ural Mountain, properly so called, as the Mugojar Hills are of the Guberlinsk; but the further

they advance to the south, they lose in breadth. In the country of the Airuk, this range of heights has exactly a direction from north-north-east to south-south-east; and at this spot it seems, to judge by the eye, to be from eight to ten versts in width. It exceeds in height all the others of the Steppe, and reaches its greatest elevation at Guberlinsk. The highest point of the road (a mile-stone) between Khabarni and Guberlinsk, was, from barometrical observations in the year 1832, 679·0 Paris feet above Khabarni, and in the year 1833, 668·9 feet, making only a difference of ten feet. But there is a hill lying close on the left bank of the Ural, which is a little higher. I found it, by the observations of former years, 739·8 feet higher than the bed of the Ural. The Airuk *seemed* to me—my barometer had been broken a few days before—full a 1000 feet above the plain. It is called Mugojar by the Bokharians and the Russians who accompany the caravans; but that name which is given on the maps to the whole range of heights is unknown to the Kirgiz, who have no common appellation for it. A day and a half's journey further south, towards the Aral Lake, this range is considerably depressed. The Airuk is, by the odometer, 450 versts direct distance from the Orenburg line, and 350 from the Aral.

The *Bosaga-Tau*, and its easternmost division, called Urkach (Camel Hill), penetrates the western territory in a north-west direction; it is, however, immediately and evidently connected with the Mugojar Hills, south of the sources of the Ilek, and it separates the basin of the Emba from that of the Ilek.

The Kara-Adir-Tau penetrates the east country, separating the basin of the Or from that of the Irgiz; its northern ramification, called *Jhabuki Karagaï*, on

Levshin's map (see below), is remarkable for the forests of fir trees still existing. The branch which approaches to within eighty versts of the fortress of Orsk, is known by the singular name of the *Kamishlakinetz* Hills. This has no immediate connexion, that I am aware of, with the hills of Mugojarsky.

Finally, we have to enumerate amongst the water dividers, those *circular hills* which stand single, and in no visible connexion with either of the three elevated ranges above mentioned, and which hills enclose a basin, or crater, with a lake. I broke off, and have brought away with me, pieces of the rock of which they are formed, where it was seen in the vicinity of saliferous gypsum: these will serve to denote their formation. These circular hills are:

1. The *Katanadir-Tau* (old woman's hill), between the *Khaïnle-Sai* and the *Uïsul-Kara*, not far from the right bank of the Or.

2. The *Mertwii Soll*, not far from the left (?) bank of the Ilek, between Iletzkaya Sashchita and the station of Elshanskoï.

3. The Inderskoye Hills, which enclose the well-known large salt lake, on the left bank of the Ural.

A.—FLUVIAL BASINS TO THE WEST.

(1) The basin of the Ilek, whose general direction is N.W., and its principal sources in the country called Bish Tamak (five mouths), are on the north flank of the Bassaga Tau. Some of its eastern affluents, as the Yakshi, the Yaman Kargala, and the Ku-Ugach, come from the principal summit of the Mugojar Hills. Guberlinsk, the place nearest to the general line of the basin, is only 120 versts from Bish Tamak, where the Ilek itself is about 89 versts from the Ural at Verkhne-ozernaya.

(2) The basin of the Emba, whose general direction is S.W. The sources of the main stream are near the *Airuk*—some of them come from Urkach, two and a half long days' journey off, whence also is derived the *Kuldenen-Timír*. It receives its chief affluents through the three *Timírs*, all of which after their junction empty themselves into the Emba, only one day's journey from its source.

It is remarkable, that south of Iletzki-Gorodok, where the Ilek joins the Ural, no other important river, and only some very small and insignificant streams, flow into the Ural, either from the right or the left. The *Uil*, indeed, to the east of the Ural, and the two Uzen to the west, are not so small; these, however, reach neither the Caspian nor the Ural, but are lost in salt and rushy lakes, which are doubtless relics of the subsidence of the Caspian. Of those rivers, the former is lost in the Kamish-Shamarskie, the latter in the great Karakul Lake, east of the Inderskoye salt lake.

B.—FLUVIAL BASINS TO THE EAST.

(1) The basin of the Or; principal direction north-north-east. Its source is on the east slope of the Mugojar Hills, 300 versts from Orenburg in a direct line. Its western affluents come from those heights; those from the east come from Kara-Adir-Tau. The most important of the former are, the Great and Little Mandlibai, a few versts south of Orsk; then the Mamut and the Kainle-Sai, south of the Katanadir Hills; the Uïsull-Kara, Yaman-Su, and Yak-Su.

(2) The basin of the Irgiz. There are three rivers of this name. The source of the Ulu-Irgiz lies only 25 versts south of that of the Or, on the eastern slope of the Mugojarsky Hills. It flows with many windings,

whence its name, into the Aksakal, shortly after it has been joined by the Kichi-Irgiz, from the north, and from the Kara-Adir-Tau. The third of this name, Tchi-Irgiz, flows from the southern flattened plateau of the Mugojarsky Hills, and goes immediately into the Aksakal Lake. This cannot be more than 200 versts S.E. of the source of the Ulu-Irgiz; and it is so overgrown with rushes, that in the summer time the water of the lake is scarcely perceptible.

(3) The basin of the rivers which fall into the left bank of the Ural, and which flow from east to west. Of these the most remarkable are, the Kumak, the Sunduk, and the Gumbaïka. They all come from the western slope of the Kara-Adir-Tau, which is to the north of Orsk. This range of mountains divides the basin from that of—

(4) The Tobol, &c. This is the extent of my own observations. It is still to be observed, that—

(i) There is a connection of no great distance between the Obchei-Syrt and the Ural range; of which the former is doubtless a westerly ramification.

(ii) That the main range of the Ural Mountains* is on the right bank of the Ural River. The Kara-Adir-Tau is certainly a prolongation of that mountain, but not to be considered as one of its principal ramifications.

(iii) The Mugojarsky Hills are connected with the Ural range, and continue in the same direction.

(iv) The Kara-Adir-Tau is not completely separated from the whole basin of the Or.

* The relations of the three Ural chains, *i. e.*, Kara Adar, Irendik, and Inemel, as well as the Absharán of the Obchei-Syrt (west of Beloretzkoï, almost under the 54th degree of north latitude), are very well given on Helmersen's map of the South Ural. I have made no change in the orthography of the letters above published, or of the memoir by Count Cancrin.

In my review of this country, I have derived assistance from the map of M. Levshin, who has published in the Russian language a description of the small Kirgiz hordes. (Petersburgh, 1832, vol. iii. 8vo.) It is the most detailed map of the district; but it is by no means fit to give a clear representation of the country, as the indication of the hills is too complicated, and the different separations of the waters are not sufficiently distinct. All the high ranges run into one another, and take the most extraordinary directions. The map of Siberia, published in 1825, and which is in my possession, is perfectly useless for the country in question.

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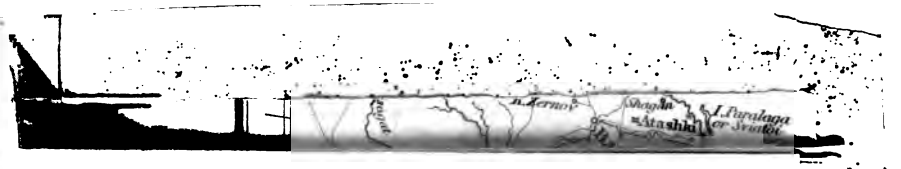
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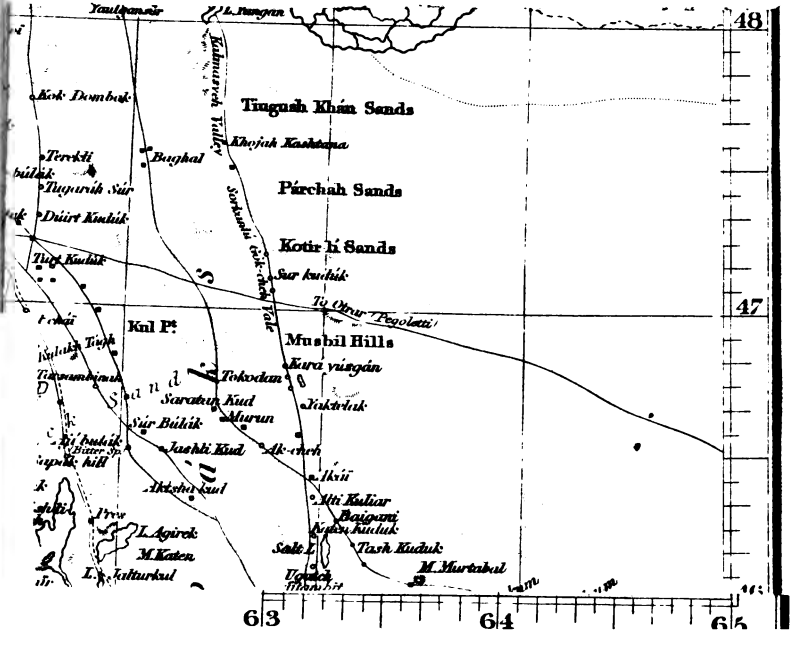
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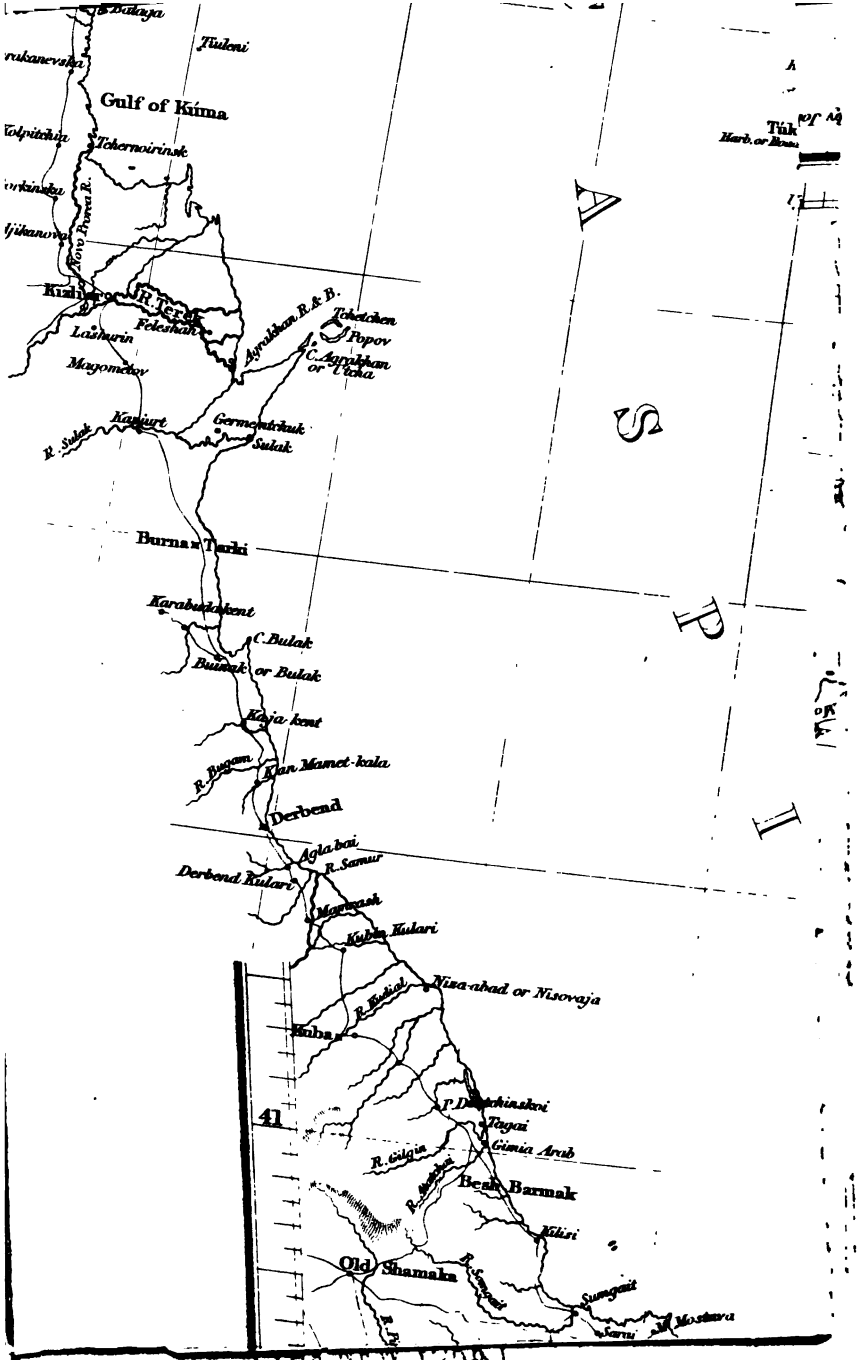
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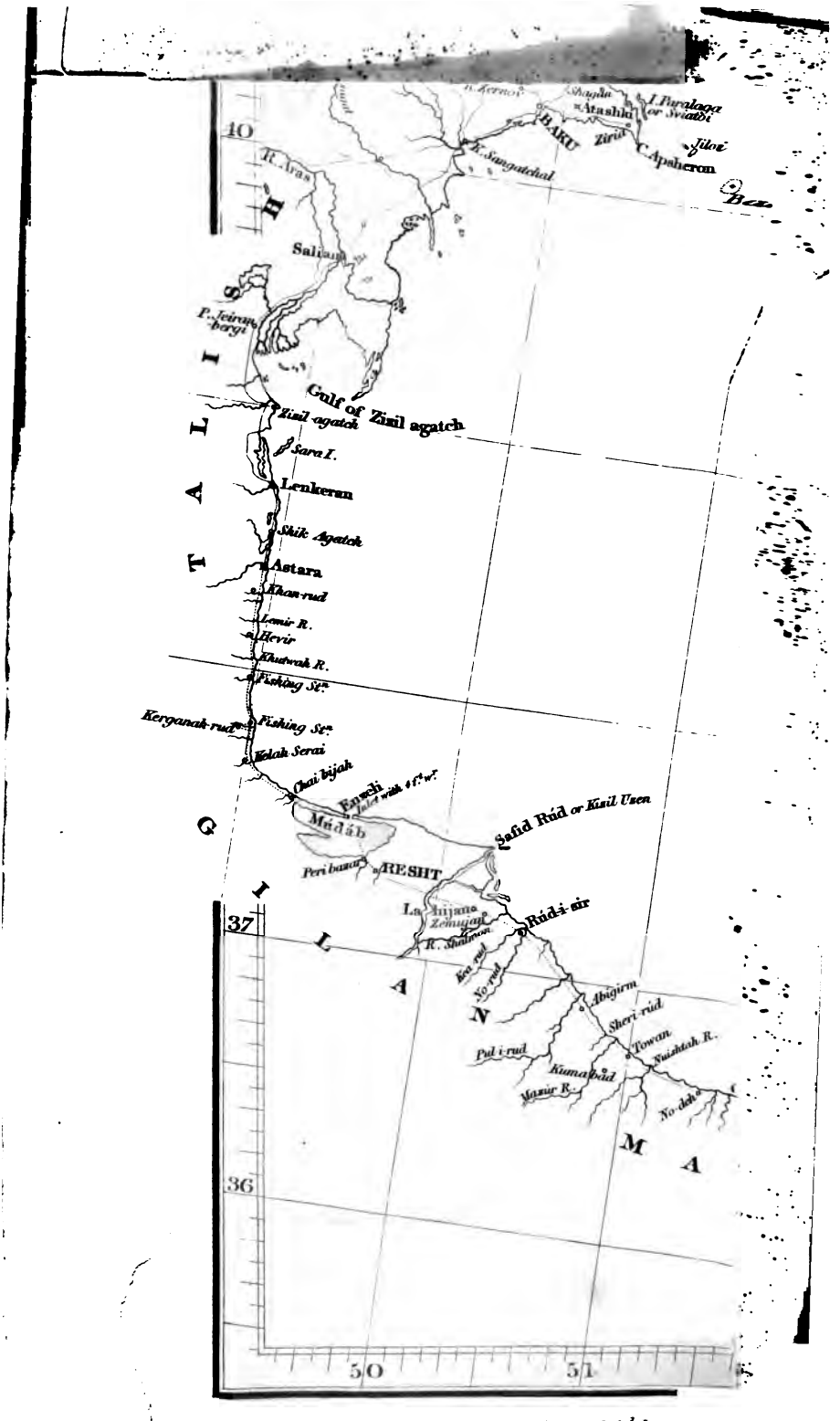

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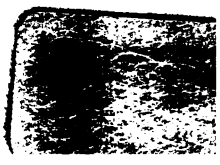

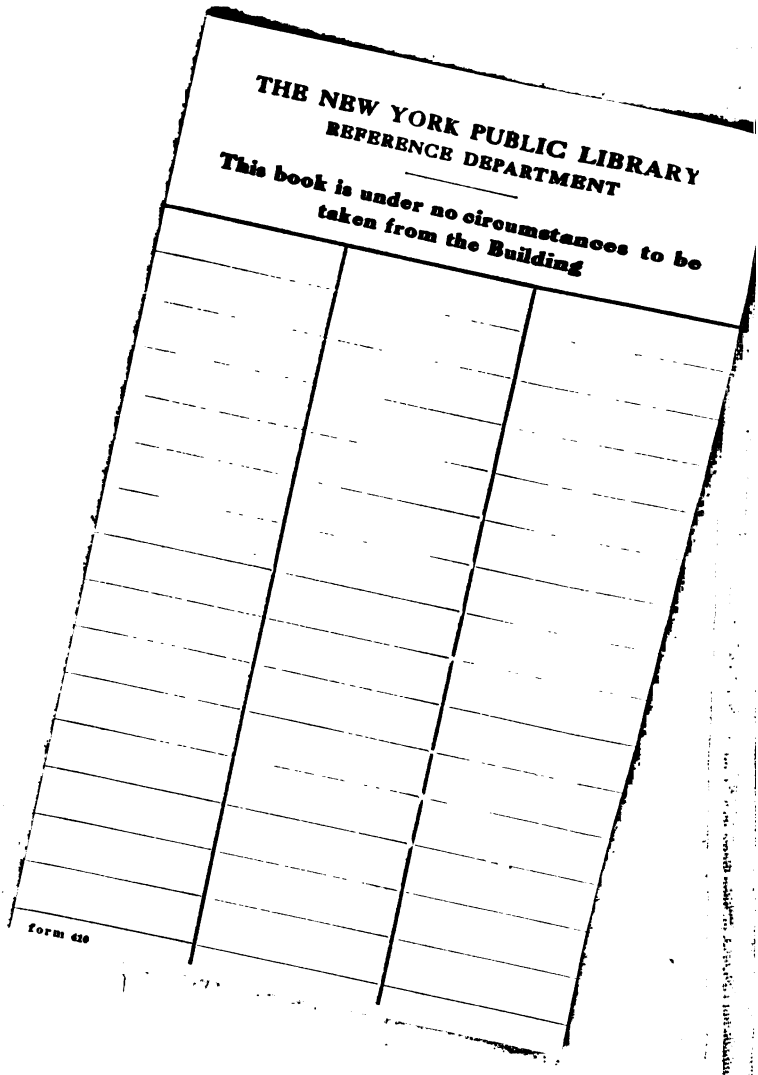
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